THE MATERIAL CULTURE OF THE MARQUESAS ISLANDS

By Ralph Linton

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Ralph Linton served as ethnologist with the Marquesas party of the Bayard Dominick Expedition, 1920-1921, devoting his attention to material culture and archaeology. Supplementary to the field work a study was made of the Marquesan collection in museums of the United States.

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THE MATERIAL CULTURE OF THE MARQUESAS ISLANDS

BY

RALPH LINTON

INTRODUCTION

GEOGRAPHIC SKETCH

103 The Marquesas include thirteen islands. The eight habitable islands form geographically two divisions—the Northern Division, which includes Ei Ao, Nuku Hiva, Ua Huka, and Ua Pou; and the Southern Division, which includes Hiva Oa, Tahu Ata, Moho Tani, and Fatu Hiva. (See fig. 1.) Ei Ao and Moho Tani, although formerly inhabited, are now deserted.

[131]
[132]

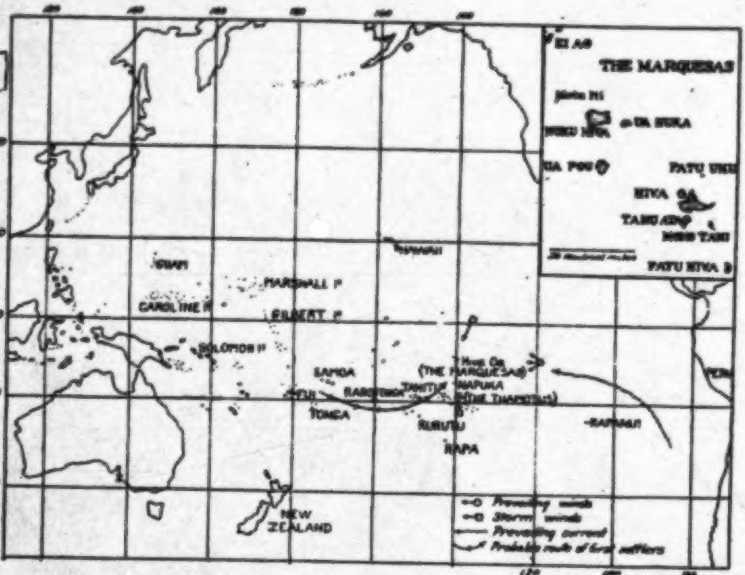
EI AO
THE MARQUESAS
Motu Iti
NUKU HIVA
UA HUKA
UA POU
FATU UKU
HIVA OA
TAHU ATA
MOHO TANI
FATU HIVA
GUAM
MARSHALL I.
CAROLINE I.
GILBERT I.
HAWAII
SOLOMON I.
SAMOA
FIJI
TONGA
RAROTONGA
TAHITI
HIVA OA (THE MARQUESAS)
NAPUKA (THE TUAMOTUS)
RURUTU
RAPA
RAPANUI
PERU
NEW ZEALAND
Prevailing winds
Storm winds
Prevailing current
Probable route of first settlers
120
100
80

FIGURE 1.—Map of a part of the Pacific showing the position of the Marquesas and the principal islands of the group. The islands Ei Ao, Motu Iti, Nuku Hiva, Ua Huka and Ua Pou, constitute the Northern Division of the Marquesas, and the islands Fatu Uku, Hiva Oa, Tahu Ata, Moho Tani, and Fatu Hiva, the Southern Division.

[Note: this source has two sets of page numbers]

133 The habitable islands are of volcanic origin. At present there are no signs of volcanic activity and earthquakes are unknown, but on some islands old sea caves now several meters above high water level suggest that elevation still continues. The topography of all the large islands is similar, each having a high central mountain chain from which sharp ridges, often ending in sheer cliffs, extend to the sea. With a few exceptions, the valleys are short and narrow. There is no coastal shelf and many of the valleys are accessible only from the sea. Nuku Hiva and Hiva Oa, the largest islands of the group, have so-called plateaus at altitudes of from one to two thousand feet. These plateaus include some areas of comparatively level ground, but are for the most part eroded into innumerable small, steep side valleys, which render traverse difficult, even for a man on foot.

132 The climate of the Marquesas is without extremes of heat or cold, the mean annual temperature being between 75 and 80 degrees Fahrenheit. Hurricanes, the scourge of the Tuamotus, are rare, but lying north of the belt of seasonal rains, the islands are visited by destructive droughts which have been known to last three years. Even in favorable years the climate throughout most of the group is dry rather than humid. There is a progressive decrease in rainfall from south to north; Fatu Hiva, the southernmost island, is well watered but Ei Ao, the northermost, is arid. The prevailing winds are easterly and the westerly sides of the most of the islands are semi-arid, with few running streams.

137 The marked differences in the vegetation on different islands and on different parts of the same island correspond to variations in rainfall. On Fatu Hiva a dense growth of vegetation mantles the almost vertical sides of the mountains and fills the valleys with thickets. East of the high mountain ridge on Hiva Oa the valleys are choked with thick bush and the higher slopes are covered with forests containing many tree ferns. West of the ridge the tree ferns disappear completely, giving place to stunted guava scrub and upland reed, and large areas are covered with matted fern scarcely a foot high. Wherever a depression serves to collect the moisture there are open groves of pandanus or fau (tree hibiscus) while the higher ridges are crowned with straggling clumps of casuarina. The slopes of the deeper valleys are covered with a growth of large trees beneath which is little or no undergrowth and only along the water courses, where the fau grows in tangled masses, is there any approach to jungle. Were it not for the occasional clumps of palms in the valleys the visitor might imagine himself in the hills behind San Francisco rather than on an island within ten degrees of the equator. Ei Ao, the northernmost island, has the least rain, and its bowl-like top is covered with short grass and scattered groves of trees so open that a man on horseback could pass anywhere with ease.

133 From the point of view of the primitive settler, the Marquesas could hardly be considered desirable country. The mountains everywhere extend to the sea, and the little level ground on the plateaus is rendered uninhabitable by the droughts. The numerous valleys are for the most part small and many of them contain no land suitable for cultivation. Terracing, which might have increased the arable area, is almost useless without some system of irrigation, and this is rendered impossible by the uncertain rainfall. There are no native wild animals [136] larger than the rat, and the absence of a barrier reef decreases the supply of fish, and makes fishing arduous and uncertain. Opposed to these disadvantages are a climate ideally suited to the growth of breadfruit and coconut, and at least partial immunity from attack as a result of the geographical isolation of the valleys.

SETTLEMENT AND POPULATION

174 So far as known there are no native accounts of the original settlement of the Marquesas. The legends collected by the Bayard Dominick Expedition show a belief in a local creation. Legendary material and the constant repetition of tribal and place names in the various islands of the group would seem to indicate that the historic inhabitants were descended from a few small parties of settlers who occupied the most fertile valleys of the southern islands first, spreading as their numbers increased until the occupation of the group was complete. There is no legendary evidence of organized conquest or of an early non-Polynesian population. The local differences in culture and physical type which existed in the Marquesas at the beginning of the historic period seem to point, however, to the presence of two originally distinct racial elements. One element, which was dominant in Hiva Oa, Tahu Ata and Fatu Hiva, showed many affinities with the Maori of New Zealand. The other element, which was dominant in Nuku Hiva, Ua Huka and Ua Pou, showed affinities with western Polynesia. It seems improbable that these two elements arrived in the group simultaneously but it is imposible to say which came first. In historic times the western Polynesian element in the Marquesas was strongest in the localities which were least desirable and farthest from the probable place of arrival of immigrants to the group. This may indicate that this element arrived first and had been ousted from the more favorable localities by the Maori-like element.

There seems to have been no important invasion of the Marquesas after their settlement by these two racial elements. The Tuamotus was the only island group near enough to serve as a base for organized attack and these islands were small and sparsely populated. It was not impossible for small bands of invaders to reach the Marquesas from time to time; but even if they were successful in this, the nature of the country would have limited their occupation

174 to a few valleys where, in the absence of *reinforcements*, they would eventually have been wiped out or would have merged with the native population.

A glance at a map of the Pacific (fig. 1) will show that in spite of their comparative immunity from attack the Marquesas are by no means isolated. The Tuamotu chain links them with the Society Islands on the south, and widely scattered islands to the northwest connect them more remotely with Hawaii. Small groups of castaways who had been driven out of their course must have arrived in the Marquesas from time to time and probably met with a friendly reception. There are numerous records of such involuntary voyages in other parts of Polynesia which show that great distances were sometimes covered in these drifts and influences from western Polynesia and even from Micronesia may have reached the Marquesas in this way. The Marquesans themselves made long voyages, some of which are said to have extended as far as Rarotonga with stops at others islands en route. They were not conservative and their natural mechanical ability made them quick to recognize the value of new appliances. It is probable, therefore, that the historic culture of the Marquesas was a blend of the culture of the two groups of early settlers plus a few features which had been introduced from widely diverse sources.

167 It seems certain that the population of the Marquesas had reached its saturation point before the time of the first European contact. Even the smallest and least hospitable valleys contain stone house-platforms, while the remains in the more favored localities indicate a dense population. Although the increase was checked somewhat by constant inter-tribal wars, the pressure had become sufficiently acute to lead to a resumption of organized expeditions in search of new lands. According to Porter (49, p. 93) the emigrants took with them domestic animals and plants in preparation for the founding of a new colony, and sailed under the direction of priests. The magnitude of the exodus may be judged from the fact that Porter's informant, Wilson, told him that, to his knowledge, eight hundred men, women and children had left the group in this way, none of whom had ever been heard of afterward. At least one of these emigrant groups is known to have established itself in an island of the northern Tuamotus, but the greater part probably sailed on westward into the empty ocean until they perished.

161 The various early estimates of the population of the Marquesas have been collected by Clavel (12) as follows: Cook, in 1773, estimated 50,000 for the Southern Division alone, giving 100,000 for the whole group. Krusenstern, in 1804, gave 16,000 for Nuku Hiva alone on the word of a resident European, but considers 12,000 as more probable. This would mean about 50,000 for the whole group—an estimate Clavel considers the best. Porter, in 1813, gave the popu-

lation of Nuku Hiva as 80,000 which is obviously an impossible number. During the early part of the nineteenth century the population declined rapidly as a result of diseases introduced by the European whalers. Du Petit-Thouars, in 1838, estimated the population at 20,000; Houan, in 1856, gave 12,500 as the grand total, and an actual census at the time of Clavel's visit in 1883 showed 4,865. Since that time the decline has been steady but less rapid, the present inhabitants numbering about 3,000, many of whom are Chinese or European half-castes. These half-castes are more resistant to disease than the pure-blood natives and through them the language and fragments of the culture will probably be preserved for several generations. The survival of the pure native stock is doubtful, although in 1920 the natives of the island of Ua Pou, who were only slightly mixed, were holding their own, and those of Ua Huka showed a slight increase in number. The most rapid decline is in the southern islands where intensive European contact is more recent. On one of these islands, Tahu Ata, there are said to be nearly a hundred deaths to every birth. The influenza epidemics, so destructive in Polynesia, did not reach the Marquesas. 161 [144]

SOCIAL ORGANIZATION AND RELIGION

An account of the religion and social organization of the Marquesas is given by Handy (32), but a resume is necessary as a background for the present study of material culture. 105 619

The natives were divided into a great number of tribes which were for the most part mutually hostile. As a rule each of these tribes occupied a single valley, but several of the larger valleys were occupied by two or more tribes who often fought among themselves, although they usually united against outsiders. Thus in the valley of Tai-pi Vai, rendered famous by Melville's narrative, "Typee," there were three groups of people. One group occupied the head of the valley; a second, the middle; and a third, the lower end. The hostility between these groups was so strong that even after their ostensible conversion to Christianity it was necessary to build a church in each section to prevent fights during religious services. No governmental unit larger than the tribe existed, but there appear to have been shadowy confederacies of several tribes, who combined for action in case of hostilities from other tribes. In Nuku Hiva and Hiva Oa at least, there were still larger dual divisions, comprising the eastern and western halves of these islands. The only approach to centralized power appears to have been in the island of Ua Pou, where the inhabitants of one valley had extended their sway over all the other tribes, but even here the autonomy of the conquered groups does not seem to have been seriously interefered with.

105 643 At the head of the tribe stood the chief, but he appears to have been a different functionary from the Hawaiian or Tahitian ruler. The concepts of divine descent and absolute power were lacking among the Marquesans, and there was no sharp line of demarkation between the ruled and ruling classes. As in all other parts of Polynesia, the office was hereditary, but the chiefs frequently sought to strengthen their position by alliance with influential families of commoners. Such alliances were formed principally through adoption, and the chieftainship might in this way pass out of the line of actual blood descent. The chief was looked upon as the director of group activities, and in some places at least, as the owner of the tribal lands. His power was by no means absolute, however, and in case of oppression his followers might desert and pass into the service of another chief. It is an interesting fact that the chief does not seem to have been expected to expose his person in war. Battles were directed by war leaders (*toa*) who were men of proved valor. Within many of the fortifications visited, small enclosures were pointed out as the place where the chief took refuge with a body-guard of picked men, during an attack.

793 105 Second to the chief, and with power almost equal to his, was the inspirational priest (*tau'a*). This personage was believed to be the mouthpiece of the god, and as such had much influence in secular as well as religious matters. The relative power of the chief and *tau'a* in any community no doubt depended largely upon their personalities, but on the whole the power of the *tau'a* appears to have been inferior, final decision in most matters resting with the chief.

105 461 Next in importance below the chief and *tau'a* ranked the heads of large families. Below these in turn seem to have been classed the master craftsmen of various trades, *tuhuna*. Such men appear to have been regularly instructed and were extremely jealous of their trade secrets. They were employed and well paid by chiefs and rich commoners, who fed and housed them while the work was going on. It is an interesting commentary on the position of the skilled workman in the social scale that even chiefs did not consider it below their dignity to make and sell objects. Gracia (28, p. 149) mentions a chief who derived most of his revenue from carving pipes.

105 619 484 In spite of the difficulties of land communication, the lack of centralized authority, and the almost constant inter-tribal wars, the isolation of the various valleys was more apparent than real. Due to the involved native relationships, and especially to the practice of adoption, many individuals were under the protection of more than one tribe and could serve as go-betweens. *Tuhuna* of important trades also appear to have been able to travel with considerable safety as their services were much in demand. Great fetes given by one tribe were often attended by contingents from other tribes with whom the givers were tempo-

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619

rarily at peace, and some stories indicate that visits paid by one tribe to another were not unknown. Such fetes and visits frequently ended in a general fight, but they gave an opportunity for the exchange of ideas and objects, and tended to break down any cultural differences which may have existed. Still more important factors in the establishment of cultural unity were the local industrial 438 specialization, and the trade which certainly existed in pre-European times. 105 At present it is difficult to determine the extent of specialization and trade. All the larger valleys, at least, were able to manufacture the objects that they used, but because of better materials, or of superior technical skill, particular valleys or islands were recognized as preëminent in the making of objects of a certain class. Thus some stone adzes were unquestionably manufactured almost everywhere in the group, but those made on the island of Ei Ao were of better material and were regularly exported. The great size of the Ei Ao workshops would seem to indicate quantity production, and it is evident that the workmen specialized in the finer and less bulky forms. Similarly the islands of Ua Huka and Ua Pou contained large deposits of rock suited to the manufacture of *popoi* pounders and exported many of these implements to other islands. The natives of Nuku Hiva knew how to manufacture a special kind of yellow paint or dye which was highly valued in the other islands, while those of Fatu Hiva were famed for their skill as carvers. There seems to have been no formal trade; there was no regular medium of exchange and even the existence of definite barter is doubtful. The transfer was in the nature of a gift exchange.

The material culture of the Marquesas as a whole was almost uniform, 105 a fact the more remarkable in view of the dialectal differences between the Northern Division and the Southern Division of the group, and even between different tribes on the same island. The local differences which exist have been pointed out in the body of this report. The long contact between Europe and the Marquesas has resulted in the almost complete destruction of the native culture and the information obtainable regarding ancient customs and materials is often fragmentary. The use of certain objects in museum collections has been entirely forgotten and only the names of many other artifacts are remembered.

SCOPE AND ACKNOWLEDGMENTS

The scope of the present paper has been purposely restricted to an account 128 of the material culture of the Marquesas. Certain obvious similarities and differences between the Marquesan culture and that found in other Polynesian islands have been pointed out, but a thorough comparative study has not been attempted. Detailed descriptions of the preparation of food and of the ritualistic observances accompanying the various industries have been omitted. They are discussed by my colleague, E. S. Craighill Handy (32).

000 Thanks for kindness and hearty cooperation are due to many European residents in the Marquesas, especially to M. Du Poyen de Belleisle, Administrator of the group, M. Paul Vernier and Mr. Frank Varney of Atuona, Pere Simeon Delmar, of Taiohae, and Mr. Henry Lie of Pua Ma'u.

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The use made of photographs received from various sources is acknowledged in the legends accompanying the plates. Except as otherwise indicated, the illustrations are based on material in the Bernice Pauahi Bishop Museum.

HOUSES

THE MARQUESAN DWELLING AND ITS ADJUNCTS

342 343 The establishment of a Marquesan commoner consisted of only two houses, the dwelling and a cook house—an open shed with a frame of the dwelling type. Both buildings stood in a small yard which was often enclosed by a rough stone wall about three feet high. Rich commoners had another house, the store house (*fata'a*), which was usually built near the end of the dwelling. A chief's establishment was much more elaborate, consisting of a dwelling, a cook house, a store house and a men's house or warriors' house which served as an eating place for the chief and as a general club room and assembly place for his male friends. Both the store house and warriors' house were tapu to women. The chief's establishment was always built near the tribal assembly place (*tohua*) and the public sacred place (*me'ae*). Both of these structures were considered the property of the chief.

342 Very few buildings of aboriginal type are in use in the Marquesas at the present time and no large structures of ancient form have been erected in recent years. The Marquesans appear to have had only two types of houses although there were several minor variations of one of these types. One type, which will be referred to as the small house type, was used for all sorts of small and temporary structures built with a minimum of labor. The other, which will be referred to as the dwelling type, was used for residences and for all other large and permanent buildings. Most houses were built on the ground or on stone platforms (*paepae*) but a few structures, notably the store house and the houses in which young people received religious instruction, were raised on posts.

THE SMALL HOUSE TYPE

[824] Small temporary houses were erected for the accommodation of women during childbirth, as dwellings for solitary old people, as places for the tattooing of women and commoners and as camping places in uninhabited valleys. As a rule such houses were built on the ground without a stone platform and were of simpler construction than the dwellings. The framework consisted of two end posts supporting a ridge pole against which two rows of light poles were leaned from either side, forming the rafters. The main timbers were not dressed but the rafters, commonly of fau wood, were stripped of their bark. This bark was twisted into strings and later used to tie on the thatch. The timbers of the framework were lashed together with bark string. The thatch was usually made of coconut mats arranged longitudinally, the lower edge of each mat overlapping the top of the one below. These mats were fastened to the rafters by strips of

342 fau bark passed around the heavy split midrib which formed the upper edge of the mat. The completed house was triangular in cross section, being in fact a simple roof with the eaves resting on the ground. One of the ends was usually closed with coconut mats, arranged like those on the roof, and tied to the end rafter on each side and to the end pole. Houses of this type were simply shelters made with the minimum of labor, and were never decorated. They are still in occasional use throughout the Marquesas, and appear to be the same in all the islands.

THE DWELLING TYPE

THE HOUSE PLATFORM (PAEPAE)

The dwelling type includes practically all Marquesan buildings, whether domicilary or ceremonial, although certain religious structures reveal a modified form. Nearly all permanent houses in the Marquesas were built upon stone platforms, known as *paepae*. The use of stone platforms was so nearly universal in Polynesia that it seems probable that the idea was brought to the Marquesas by the original settlers, but the nature of the terrain was such as to greatly stimulate its development. In most of the valleys it was necessary to either terrace or excavate in order to have a level floor and the abundance of loose stone made terracing easy. Many of the *paepae* on hill slopes were simple terraces with a trench at the rear to carry off water. The front height of such *paepae* depended, of course, upon the slope and the width of the level space desired. Front walls as much as ten feet high were not uncommon but the back of the terrace was usually at the level of the original surface, or only sufficiently raised to keep the floor from being flooded in rainy weather.

Even on level ground nearly all the houses were elevated on stone substructures which were sometimes remarkably massive. The natives stated that these level ground *paepae* were intended to keep pigs from entering the house. The alternative of erecting the house on piles was prohibited by the danger that children might get under it—a serious matter under the old regime, as anything which passed over a child's head became tapu and had to be destroyed. *Paepae* on level ground ranged from simple pavements—a form usually limited to dry localities—to massive structures six to eight feet high. The average height for all the Marquesan *paepae* is about three feet. They are highest in Nuku Hiva from which island they steadily decrease southward, the Fatu Hivan *paepae* being, on the whole, the smallest in the group. All *paepae* were rectangular in outline, the upper surface being divided longitudinally into two unequal parts one of which was from eight to thirty inches higher than the other. The higher part, which was always at the rear, served as the floor of the house and the lower part as a veranda and general lounging place. In Nuku Hiva and Ua Huka the *paepae* were much wider in proportion to their length than in Hiva Oa, Tahu Ata and Fatu Hiva, many of them being almost square, but the house floor was everywhere long and narrow. The local differences are due to the greater or less width of the veranda part. 342

The perfect *paepae* contains stones of three sorts: large irregular stones, preferably water-worn, used for the walls; flat, water-worn bowlders, used to pave the veranda and house floor; and large rectangular slabs of cut stone (*ke'etu*), used to face the front of the elevated house floor. The *paepae* show all degrees of variation, from this ideal arrangement, depending upon the materials available, the importance of the owner and the local excellence of the mason's art. In Nuku Hiva the *ke'etu* facing of the house floor was a practically constant feature. In Ua Huka *ke'etu* facings were common but not constant and in Hiva Oa they were limited to a few of the better built houses, usually those of chiefs. In Fatu Hiva *ke'etu* were very rare. The use of flat water-worn bowlders for paving was much more usual but even these were sometimes dispensed with. In one of the interior valleys of Hiva Oa practically all *paepae* were built of rough stones throughout. The *paepae* of a chief's house in the valley of Haka Ui, Nuku Hiva, had the house floor paved with large flat slabs which had apparently been split like European flag stones. As Stewart (59, p. 291) mentions the use of flags in this or a similar structure in Haka Ui in 1831, their presence can scarcely have been due to European influence. 342 333

After the introduction of metal tools cut stone in the form of rectangular blocks was frequently used for *paepae* and in a few recently built *paepae* the stones were set in ordinary lime mortar. [324

The building of the *paepae* was supervised by a special *tuhuna* who drew on the ground the outline of the structure and with his own hands laid the first complete course of stone. He merely supervised the remainder of the construction, leaving the actual labor to the friends and relatives of the owner. The same *tuhuna* also supervised the construction of *me'ae* and other ceremonial structures, but he appears to have been simply a master builder, not a priest.

After the first course of stone had been laid, the space thus enclosed was filled with earth and stones, and the process was repeated after the laying of each successive course until the desired height was reached. The stones of the side walls were usually arranged so as to give the largest possible external surface, although a phrase in Dordillon's Dictionary (17) "*E tuku te kea matapao haoko*" (Solid masonry—to place the long way of the stone in the thickness of the wall) shows that a more stable form of construction was known. After the side walls had been constructed the *ke'etu* were set on edge along the front of the proposed house floor, a third or even a half of their width usually being imbedded in

342 the *paepae*, and then the house floor was walled and filled until level with their
333 tops. Whether the placing of the *ke'etu* took place before or after the paving of the front part of the *paepae*, could not be ascertained. Finally the surface of both parts of the *paepae*, with the exception of the bed space of the house, was paved with flat water-worn stones, those of the house floor being smaller and more carefully selected. Holes for the accommodation of the front posts of the house were frequently left along the front edge of the floor.

342 A curious feature not observed at the present time, is mentioned by Petit-Thouars (48, p. 345) in his description of a chief's house on the island of Tahu Ata. He says, "At either end of the single apartment which forms the house there is a part of the pavement raised about thirty-five centimeters above the rest. These two platforms appear to be more exclusively reserved for the king."

352 One or two stone back rests were a rather common feature of dwelling *paepae* in Hiva Oa. These back rests were simple slabs, usually undressed, set into the pavement of the veranda section and sloping at an angle of about 45 degrees. They were commonly placed at either end of the *paepae* and so arranged that the occupant sat with his side toward the house. One interesting back rest of this sort, of recent construction, was carved from the top of a large stone set in the last course of the *paepae* wall (Pl. XL, *a*, *b*). These objects appear to have been simply a primitive form of easy chair, with no religious or ceremonial significance, but it should be noted that similar back rests were occasionally placed within the bed spaces of houses within the precincts of the *me'ae* of Hiva Oa. When they were arranged in this position they were placed against the back of the house, sloping inward, so that the occupant faced the front of the house. A few stone back rests were observed in Nuku Hiva and Ua Huku but they were uncommon there.

342 In the paved space before the house, many large Nuku Hivan *paepae* have a rectangular pit running down to the original ground level. These pits are lined with stones throughout and were certainly built at the same time as the *paepae*.
[784] Two explanations of these pits were given by informants: That they were repositories into which objects that had become tapu were thrown and that they
[778] were larders or small *ma* pits. It seems unlikely that they were used as *ma* pits, however, as *ma* can only be preserved properly in pits dug in compact clay soil. Several old informants claimed that they had seen objects which had become tapu through touching the head of the oldest son thrown into such platform pits. In the valley of Hatiheu, Nuku Hiva, a pit of this sort had been used as a burial place for the owner's family, which had been wiped out by an epidemic. The house was afterward burned and the place declared tapu. Similar pits are a constant feature of the simplest form of *me'ae* in Nuku Hiva, but the majority of the *paepae*

342 [251] in which they occur are unquestionably those of ordinary dwellings. No pits were observed in the dwelling *paepae* of Hiva Oa and the natives had no knowledge of such a feature. The single example seen on Fatu Hiva was in the valley of Omo'a in a *paepae* built for a chief's house; it was explained as a place for the temporary storage of food. The occurrence and use of these pits is of interest in connection with the skull pits found in many *me'ae* throughout the group.

342 323 All the Marquesan valleys afford an abundance of loose stone, a condition which, coupled with the constant necessity of building platforms and terraces, led to a development of the art of dry stone masonry truly remarkable in a people otherwise as primitive as the Marquesans. It would be difficult for Europeans to improve on the workmanship shown in many of the ordinary *paepae*. The builders seem to have taken pride in using the largest material available, bowlders weighing half a ton being quite common in these purely utilitarian structures.

POSITION OF THE HOUSE

342 As a rule there was only one house on a *paepae*, but a few *paepae* were observed on which there appeared to have been two, and possibly even three houses arranged longitudinally on the raised rear portion. None of the sites of this sort looked to be very old, and it seems probable that this was a recent development. Such a house group consisted of one large structure, the dwelling, with a small detached building at one or either end. The earth of the unpaved floors of the small buildings contained much ash and charcoal, proving them to have been cook houses. Normally a single house covered the entire rear raised section of the *paepae*, the floor of which was divided longitudinally into two almost equal sections. The front section, which formed the house floor, was paved with flat water-worn bowlders, usually small and of uniform size. The rear section, which formed the foundation for the bed, was unpaved, and its surface stood six to eight inches below the level of the floor.

FRAMEWORK OF THE HOUSE

342 335 [824] The main timbers of the house were commonly made from breadfruit wood, but *mio* (*Thespesia populnea*) was also employed, especially when the posts were carved into tiki form. The timbers were carefully hewn and dressed and sometimes were elaborately carved. The essential elements of the framework were the end posts and the ridgepole, the front posts and the stringer. The great length of some of the ancient houses, upward of a hundred feet, necessitated the use of additional posts in regard to which Gracia says (28, p. 123), "If it is thought on account of the length [of the house] that the first two posts are not sufficient they plant a third just in the middle of the hut, or even a row." None of these very large structures have survived, and it is impossible to give additional details.

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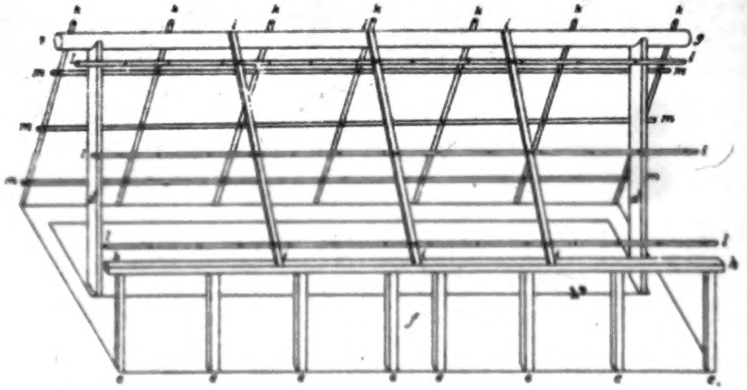

FIGURE 2.—Diagram showing framework of a house: *d*, end posts; *e*, wall posts; *f*, door; *g*, ridgepole; *h*, stringer; *i*, rafters of front roof; *k*, rafters of back roof; *l*, cross braces of front roof; *m*, cross braces of back roof.

In ordinary houses the ridge pole is supported by two posts placed one at either end. These posts are triangular in cross section and taper slightly toward the top, where they are deeply notched to receive the ridgepole. (See fig. 3.)

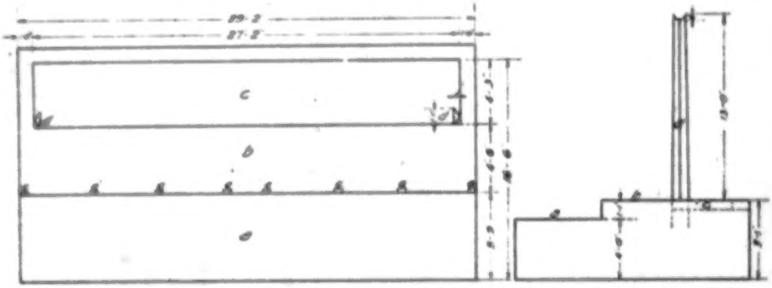

FIGURE 3.—Diagram of a house: *A*, ground plan; *B*, end view showing elevation of the paepae. The parts of the structure indicated are: *a*, paved space in front of the house; *b*, paved floor of house; *c*, bed; *d*, end posts; *e*, wall posts.

Measurements of an end post from a typical dwelling house are: height, (from surface of *paepae*) 13 feet; width at bottom, 12¼ inches; width at top, 8 inches;

thickness at center (bottom) 4½ inches; thickness at edges, 2 inches; depth of notch for ridgepole, 6 inches. 342 335 The thickness of the edges remains fairly uniform for the entire length, but the central thickness decreases slightly toward the top. The end posts are planted at either end of the bed space, 6 to 8 inches within the line of the end wall of the house, their broadest sides being toward the interior of the house. In the houses of Hiva Oa the forward edges of the end posts rest against the rear edge of the paved house floor, but in those of Nuku Hiva the posts are placed a foot or more further back, giving the rear roof a much more abrupt pitch.

In all the houses seen the ridgepole was hewn from a single log and ran the entire length of the house, projecting slightly beyond the end walls. Informants say that a palm log was formerly used for this member, but all those seen were of breadfruit wood. Much care was evidently expended in shaping the ridgepole properly. The ridgepoles seen in the Northern Division were round and had been rubbed down to a smooth surface, while those of Hiva Oa were polygonal in cross section with eight to twelve facets of approximately equal width, each of which ran the entire length of the timber. The ridgepole rested in the notches of the end posts, but was not attached to them in any way.

The front posts in ordinary dwellings varied in height from three to five feet, depending upon the size of the structure. In Hiva Oa and Tahu Ata they were commonly rectangular in cross section, but Stewart (59, pp. 233-236), who gives the best early description of Marquesas houses, says that those used in Nuku Hiva were round. The front posts of a large house on the island of Ua Pou were rectangular in the center, but tapered toward the top and bottom, and were almost round at the extremities. In Hiva Oa and Tahu Ata the central pair of posts, which formed the jambs of the door, were cut in such a way as to leave a projecting semicircular shelf at the top. When the posts were carved in the form of tiki a short cylindrical neck was usually left projecting above the head of the figure. The upper ends of the posts were either finished with a semicircular notch, like that on the large end posts, or with a neck which fitted into a hole pierced through the front stringer, or were simply left flat. It is probable that posts with notched ends or necks are ancient and that posts with flat ends were made after the introduction of metal tools.

There were usually six front posts, although houses with four and eight front posts were observed and large houses may have had more. The central pair were rather closely spaced, serving as the jambs of the door, while the others were placed at equal intervals between these and the ends of the house. In most of the structures visited the front posts were not planted in the platform; they were held in place at the bottoms by a deeply notched stringer running the entire

342 335 length of the house—probably a modern development. In the old house in Ua Pou they were planted immediately behind the *ke'etu* facing the raised house floor, and informants say that holes edged with flat stones were left for the front posts at the time the floor of the house was paved.

Three types of top stringer were used: A simple rectangular beam; a round log similar to the ridgepole, but of smaller size; and a peculiar L-shaped form, said to have been characteristic of the Southern Division in ancient times. Rectangular stringers were normal in recent structures and all those observed were either attached with nails to the flat tops of the front posts, or pierced with holes into which necks on the tops of the front posts fitted. The round stringers rested in semicircular notches in the tops of the front posts, and the only one seen in position was not attached to the posts in any way. The L-shaped stringers were hewn from single logs, and were placed outside the front posts, with their short arms against them and their tops level with the tops of the front posts. At each post the vertical part of the stringer was pierced with four holes, two above and two below, through which sennit lashings were passed back and forth around the front post. When the roof was in place these lashings were invisible from the outside. They were usually amplified on the inside to give an ornamental effect.

In a house at Atu Ona, Hiva Oa, there was an arrangement of posts and stringers similar to that of the front wall across either end of the house, and a single rectangular beam, resting upon the rearmost posts of the end walls, ran along the under surface of the rear roof and was attached to it at eight points. It is almost certain that this feature is due to European influence. A peculiar form of end frame, said to be a modern development, is described on page 295.

THE HOUSE ROOF

342 The front roof of ordinary dwellings was supported by three heavy rafters which were commonly hewn and squared. One rafter was placed in the middle of the house over the doorway, and the other two halfway between it and the ends of the house. (See fig. 2.) There were no heavy rafters at the ends of the roof, where they might be expected. The lower ends of these rafters rested upon the stringer, and their upper ends againt the ridgepole, without extending beyond either. In well built houses the rafters were attached to both the stringer and the ridgepole by elaborate sennit lashings.

The framework thus formed was supplemented by additional rafters of bamboos, or peeled poles of fau, placed vertically at intervals of two or three inches, continuing above the ridgepole and crossing the small rafters of the rear roof. They also projected beyond the stringer and below the line of the front wall, forming narrow eaves. The light rafters were held in place by three longitudinal poles, usually single bamboos, which ran the full length of the inside of 342 the roof. The two outermost poles were placed eight inches to a foot above the stringer and below the ridgepole; the third pole was placed midway between them. They were attached to all the rafters by lashings of sennit or bark string. Both the front and rear roofs projected six inches to a foot beyond the end walls.

One house in Hiva Oa (Pl. XL. *C*) had a narrow porch supported by an additional row of posts, topped by a stringer. These posts were planted in the *paepae* about two feet in front of the house wall. The rafters of this porch were inclined at a lower angle than those of the roof. This feature was not observed elsewhere and was probably due to European influence.

The rear roof extended from the ridgepole to the ground. It was usually supported by eight main rafters, but these were not hewn so far as observed. They were simply peeled hibiscus poles of slightly larger diameter than those used for the remainder of the roof. In some houses all the rafters of the rear roof were identical in size and material. Between the main rafters were smaller poles placed two or three inches apart; at the peak they crossed the similar poles of the front roof forming a crotch. These smaller poles were secured in position on the rear roof by three cross poles of bamboo, the highest being opposite the top crosspiece of the front roof, the lowest about eighteen inches above the floor, and the third midway between them. All the rafters were lashed to these cross poles.

All the early descriptions of Marquesan houses mention the rear roof as perpendicular or descending at a very steep angle, and the old pictures show this feature, also a front roof inclined at less than forty-five degrees. . Actual measurements prove that the old authors have exaggerated both these features. The pitch of the rear roofs ranges from eighty degrees in some of the houses of Nuku Hiva to as low as sixty-five degrees in an old dwelling on Hiva Oa. The pitch of the front roof seems to have been rarely, if ever, less than fifty degrees, with about sixty-five degrees as normal. In one old house in the valley of Hana Hehe, Hiva Oa, the pitch of the front and rear roofs is about sixty-five degrees for each.

The roofs of all Marquesan houses were thatched, and a variety of material was employed. In recent buildings coconut mats appear to be the most common, but two or even three sorts of thatch were not infrequently used on the same [524] structure. The thatching mats, which were eight to twelve feet long and one foot to eighteen inches wide, were made by splitting a coconut frond down the midrib and interweaving the leaflets of either half to form a long narrow mat of checkerwork pattern. Mats of this sort are still in common use in most parts of Polynesia. The mats were placed on the roof either singly or in pairs, with the midrib edge up and were tied to every third or fourth rafter with loops or sennit or sewed on with bark string. A large wooden needle was used for sewing. The [412]

342 thatch was lashed to each rafter with a single cord running the height of the roof. The bottom tier of mats was laid on first, and the successive tiers were laid on shingle fashion, with a deep overlap. As the successive layers were rarely more than two or three inches to the weather, a well-made roof would be from four to eight mats thick.

342 824 An almost equally common form of thatch was made from leaves of the breadfruit tree. Long straight upland reeds, or occasionally hard-wood shoots, were gathered and the leaves were strung on these by holes pierced at the juncture of the stem and leaf, the top of one leaf resting against the bottom of the next. These rods were then attached to the rafters in overlapping rows in the same manner as the mats. When in position the leaves stood edgewise on the roof. Thatch of this sort, although shaggy and rather unpleasing in appearance, is very effective and is said to outlast that of coconut mats. Where breadfruit leaves were used for thatching, coconut mats were usually substituted for the first two or three rows.

In ancient times a third form of thatch, made from palmetto leaves was used. The leaves were strung on light rods at intervals of twelve to eighteen inches, the rod passing from side to side through the juncture of the leaf and stem. The rods were tied to the rafters so that the leaves lay flat and overlapped like shingles. According to informants palmetto was commonly used to thatch the houses in *me'ae*, but was not tapu for other structures. The only example seen was on the front roof of an old chief's house in Ua Pou.

The use of pandanus for thatch is mentioned by Jardin (33, p. 51), who says that this material lasted longer than either coconut mats or breadfruit leaves, but the practice is now obsolete and only one fragment of doubtful authenticity was seen. This fragment, found in the debris of a house of Tahitian form, consisted of a hardwood rod over which the leaves had been doubled, with the two ends pinned together by a splinter a short distance below the rod. A somewhat similar technique is followed in the making of sugar cane thatch in Tonga.

Grass was very rarely used for thatch but the chief of Tetai, one of the small side valleys in Atu Ona, Hiva Oa, is remembered as having occupied a grass-thatched house, the frame of which was of ordinary Marquesan form.

342 The method of closing the peak of the thatched roof was very simple and effective and is still employed for all thatched roofs. In the crotch formed by the crossing of the small rafters above the ridgepole, a small pole was laid with its top flush with the rafter ends. Several layers of coconut mats were then laid longitudinally over this and bent down on either side so that their lower edges extended some distance below the top of the last tier of thatching. These mats were then secured in place by long wooden splints passed through them from side to

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side between the main ridge pole and the small pole. On some houses a layer of pandanus leaves was laid over the ridgepole before the small pole was put on. These leaves were then secured by an additional pole on either side of the roof placed in the angle formed by the intersection of the small rafters.

THE HOUSE WALL

The Marquesan house was substantially an open shed with the rear roof extending to the ground. The walls merely served to close the openings in the structure and could be removed wholly or in part without effecting the stability of the house. Work sheds and cook houses were unwalled, and it is probable that in former times some more pretentious structures were also quite open, for several end posts were seen that were carved on both sides. The outer side would have been invisible in a walled house. Most buildings were provided with end walls, although many ceremonial structures and even dwellings were open in front. The framework of the end walls usually consisted of four or more light poles arranged like the sticks of an inverted fan, with one end resting on the edge of the *paepae*, the other against the ridge pole. The mats or leaf-packed rods used at thatch were tied to these poles just as they would be tied to the rafters. When the ends were not thatched a number of bamboos or peeled poles about an inch and a half in diameter were lashed horizontally to the uprights. These poles were placed either touching or at intervals of about an inch, and were cut to fit accurately the width of the aperture. In some houses the upper part of the end walls was of thatch, the lower part of poles. (See Pl. XL, *C*.)

The entire front wall with the exception of the door space was occasionally covered with thatch, but the practice does not seem to have been common. In a house visited in Hokatu, Ua Huka, one-half of the front was thatched with coconut mats; the other half was left open. As a rule, however, the front wall consisted of a series of separate units or panels each of which filled the space between a pair of front posts. These panels were made of bamboos or peeled poles about an inch and a half in diameter. In all the front walls seen the poles were placed side by side and fastened together by cords running over and under so as to form a sort of heavy pole-mat flexible laterally but not longitudinally. (Similar pole-mats were used as coffin covers in Hiva Oa and Fatu Hiva.) These mats were then strengthened by three crosspieces lashed to the back, at right angles to the poles and at equal intervals. The panels were usually placed between the posts in such way that the crosspieces were horizontal, and fitted into notches cut in the sides of the front posts, but occasionally they were placed with the braces vertically, the poles of the mat then being horizontal. In one house two light poles running from the door posts to the end of the house were added on the outside, but these were not attached to the panels.

THE HOUSE DOOR

342 No doors of the ancient type have survived, but good descriptions were obtained from informants. The doorway was normally in the middle of the front wall, the central pair of posts being placed relatively close together to form the jambs, while the top stringer of the wall formed the lintel. In many houses, however, a separate lintel was placed some distance below the stringer. The doorway was then so low that a person entering was compelled to bend almost double. The object of the low doorway was purely defensive. Both high and low doorways were used in all the islands in ancient times. Two forms of door are said to have been used with the high doorways. One of these consisted of two coconut leaf mats of the sort used for thatch, one of which was tied to either door post. To close the aperture the edges of the mats were drawn together and tied. The second form of door was made by planting two strong posts in the house floor, one close behind either doorpost; two heavy planks, as high as the doorway and more than half as wide, were then hewn from breadfruit wood and placed between the door posts and inner posts on either side of the doorway, the whole forming a crude double-leafed sliding door. To close the door the two planks were slid out from either side of the doorway meeting the middle. Stewart (59, pp. 233-236) speaks of "a small door in the middle, furnished with a shutter, in a slide, to be closed or opened at pleasure." Informants in Hiva Oa said that the small doorways there were provided with a single-leafed sliding door, although the exact arrangement had been forgotten. According to informants in the valley of Pua Ma'u, Hiva Oa, the doorways, whether high or low, were arranged with inner posts, like those already described, but were closed by laying a number of timbers of breadfruit wood, one above the other, in the space between the front posts and inner posts.

INTERIOR ARRANGEMENT OF THE HOUSE

352 The interior of the house consisted usually of a single room, without par-
[342] titions, but Kruesenstern (34, p. 161) and Gracia (28, p. 123) both say that in the
better houses one end was divided off by a bamboo partition and was used as a
storeroom for valuables and Handy (32) reports tapa curtains called *kahu pahee
ioto* sometimes used in Nuku Hiva. There was no furniture; even the stools used
by some of the other Polynesian groups were lacking. The bed formed an in-
352 tegral part of the house. A strip comprising the rear half of the house-floor
513 was left unpaved at the time of the construction of the *paepae*, and this was leveled
and filled with soft earth, free from stones, until its surface was six to eight
inches below the paved forward portion of the house-floor. Two carefully
dressed palm logs eight inches to a foot in diameter were then laid along either
edge of the depression. The straightness and polish of these logs were the pride

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of the owner of the house. Two short additional pieces of palm log sometimes were laid transversely at either end of the bed space, just within the bottoms of the end posts of the house; rarely the log along the back of the bed space was omitted. The space enclosed by the logs was first filled with a thick layer of tips of palm fronds, or with ferns. Over these were laid several coconut mats, similar to those used for thatching. The mats at the rear were occasionally placed over the back log and tied to the rafters at a height of about eight inches (Pl. XL, *E*). Over the coconut mats in turn were laid woven pandanus mats of two kinds. Those covering the front part of the bed were called *moena,* and were woven of broad strips, three-eighths of an inch or more in width. Mats of this sort were tapu to men, and the use of the word *moena* as a term of reproach is known to have led to at least one murder in recent times. The rear part of the bed was covered with a mat of finer weave, called *kahua'a,* which was not tapu to men. The *kahua'a* was long and narrow, a single one usually running the entire length of the house. It was so placed that it covered the rear half of the *moena* and the back log of the bed. The outer edge of the *kahua'a* was tied up to the rafters. A narrow mat for the head alone, called *pa'i pa'i,* was sometimes placed over the *kahua'a* to prevent its being stained by the oil with which the natives soaked their hair.

Occupants of the bed lay with their heads toward the wall, the *kahua'a* supporting the head and shoulders and the *moena* the lower part of the body. With persons of ordinary height the feet projected over the inner log and rested upon the bare stone pavement.

The elaborate pillows found in some parts of Polynesia were not used in the Marquesas, but a pad of tapa was sometimes tied to the rear log of the bed under the *kahua'a.* Portable pillows called *nouni,* made from bundles of shredded *fei* leaves wrapped and tied with tapa, were also used.

According to informants a special form of bed was used at Pua Ma'u, Hiva Oa in the houses of a fishermen's sacred place, and by at least some of the priests. This bed consisted of two or more pairs of short posts, connected at the top by crosspieces, supporting a layer of small closely spaced poles. The whole formed a long rectangular bench, or shelf, raised eighteen inches to two feet above the ground. Four elaborately carved wooden legs in the Bishop Museum may belong to a bed of this type. (See Pl. XLI, *A.*) In the fishermen's sacred place each of the houses, which were very small, contained two of these beds, one along either side. Priests, after they had eaten of the sacrifice, continued to live with their families when not engaged in religious rites, but slept in a separate raised bed built for them in the common dwelling. Only coconut mats were used upon the beds of priests and fishermen, due to the ceremonial uncleanness of bed mats

352 519 of the ordinary type. It is probable that a single idea of defilement by contact with the ground underlay this use of elevated beds and the construction of the *fata'a* and *tona pou*. (pp. 294-5). It is interesting to note that in Tonga according to McKern (41) the bed of the Tui Tonga was always elevated, although it appears to have simply been built up with rolls of tapa.

HOUSE DECORATION

342 531 In the Marquesas most dwellings and practically all ceremonial structures were decorated to some extent. The *paepae* might be decorated with ornamental masonry, with figures carved in relief on the *ke'etu* facing of the raised house floor, or with small stone statues. In the house proper the decorations consisted of carved posts, ornamental lashings and occasionally of pigs' skulls. The use of human skulls as house decoration is doubtful.

DECORATION OF THE PAEPAE

The use of ornamental masonry in dwelling *paepae* seems to have been limited to the island of Nuku Hiva. There many of the house platforms had a row of *ke'etu* built into the front wall one or two feet below its top. The *ke'etu* were laid flat, with the long edge out, and from a little distance gave the effect of a narrow horizontal stripe or band—the regular width and reddish color contrasted pleasantly with the darker tint of the rough stones forming the bulk of the platform. *Ke'etu* so placed may have helped to tie the wall firmly to the earth and rough stonefill of the *paepae,* but long rough stones would have served equally well. In view of the labor required to quarry and transport the *ke'etu* it seems probable that their purpose was purely ornamental, and a proof of the wealth and influence of the owner of the house.

Some of the large dressed slabs of stone which faced the front of the raised house floor were carved. Two examples were noted: one in the valley of Haka Moui, Ua Pou; the other in the valley of Pua Ma'u, Hiva Oa. The Haka Moui site (32) is very unusual. The *paepae* was built with steps in three levels, one faced with large *ke'etu*. The *ke'etu* of the highest step were decorated with a zigzag pattern of ornamental adzing, and several of the other slabs bore full *tiki* figures or heads carved in very high relief. It is said that this structure was the residence of a chief; and became a *me'ae* upon his death. The decorations on the *ke'etu* of the Pua Ma'u site were much less elaborate; the main decoration of its *paepae* consisted of inset stone figures. On the upper side of one of the slabs facing the house floor a turtle, five inches long, was carved in low relief. The projecting end of the same slab bore a curious oval knob near the top and a beak-like projection at the bottom. This end carving is suggestive of a tenon for the attachment of another slab, but as it projected beyond the end wall of the *paepae*, which was still in good condition, the carving was probably ornamental. 342 531

The use of stone figures for dwelling *paepae* was observed only in the valley of Pua Ma'u, Hiva Oa, although certain structures in Tai-pi Vai, Nuku Hiva, which were decorated in this way may have been the house *paepae* of religious personages. The Pua Ma'u *paepae* were certainly the dwellings of chiefs, and had been occupied as residences within the memory of persons living in 1920. In all of them the decoration consisted of three stone figures which were inset between the large *ke'etu* facing the raised rear section of the *paepae*. One of the figures was placed approximately in the middle, and the other two on either side about midway between the central figure and the ends of the platform. The heads of the statues projected wholly or in part above the level of the house floor, and in one instance the head had been carved in full round. All the other figures were carved in half to three-quarters round. A tenon approximately two-thirds of the width of the body was left on the back of the figures. The slabs adjoining the figures fitted closely against the tenons on either side so that when seen from the front, the statues appeared to stand in front of and against the wall rather than to be incorporated in it. (See Pl. XLI, *D-E.*) The faces, with the exception of one unfinished figure, were of the usual highly conventionalized Marquesan type, while the carving of all the figures was remarkably fine. The statues in one *paepae* are known to have been made in a neighboring valley and brought as gifts to the chief of Pua Ma'u at the time he built the house less than a century ago, but these figures represent the highest development of the Marquesan sculptor's art. They are truly admirable in both design and execution and prove that this phase of the native culture was anything but decadent at the time of the European conquest. 342 532

DECORATION OF THE HOUSE

The most important features of the house decorations were the carving of certain parts of the frame and the use of ornamental sennit lashings. In the carved decoration two distinct techniques were employed—the timbers were either sculptured into human figures, or ornamented with non-naturalistic designs. [531]

HUMAN FIGURES

The end and front posts of most ceremonial buildings and of at least some chiefs' dwellings were carved into human figures (Pl. XLI, *B*). A number of examples were seen, but only one site was visited in which the original position of the figures could be determined. In this structure, which was certainly ceremonial, the figures supporting the ridgepole had been placed with their faces toward the interior of the house. The corner posts of the front wall also faced inward; 346 532

346 532 the other front posts faced outward. A small figure on the end post of a mortuary house also faced inward. It seems probable that this was the usual arrangement for end posts. The human figures were carved in full round, the convention employed being substantially the same as that used in the large idols of wood and stone. The heads were cylindrical, with flat faces upon which the highly conventionalized features were carved in low relief. They were finished at the top with a narrow horizontal band, above which a cylindrical neck considerably smaller in diameter than the head, supported the ridgepole or stringer. The ears, shaped like the chord of a circle, were shown as two thin flanges, projecting from either side of the head slightly behind its center. The forward surface of these flanges was carved with two scrolls of unequal length, the upper one being longer. The scrolls met at a point in line with the outer corner of the eye. In some figures a hole was pierced through the center of the lower scroll. A figure seen in Atu Ona, Hiva Oa, differed considerably from these. The roof timber of this house had rested directly upon the head of the figure without any intervening band or neck. The head was narrow, and short vertically with a marked occipital projection. The face was directed upward at an angle of about 35 degrees, and the features, although much weathered, indicated a high nose and generally naturalistic treatment.

The heads of the figures in a building usually showed uniformity in treatment and size, but the proportions of the body varied considerably, not only between the end and front posts but even between individual front posts. In the end posts the bodies and legs were unnaturally elongated, the idea evidently being to have the figure cover as much of the post as possible. In the front posts (Pl. XLI, *B*) the bodies were long and the legs disproportionately short or even lacking. The bodies as a rule showed little attempt at modeling, and were formed by a few simple planes; the arms were usually at the sides with the hands resting on the stomach. Both the upper arm and forearms were disproportionately short, and showed no attempt at modeling. The space between the upper arm and body in most figures was pierced, while the forearm was carved in rather low relief upon the body. In one specimen the hand was raised to the mouth and the upper arm was shown in the usual vertical position while the forearm and hand were unnaturally elongated; the space between the forearm and chin was pierced. The legs were always shown in a semi-flexed position with the space between them pierced. The thigh was usually short and the lower leg disproportionately long and heavy, but in the specimen from Atu Ona, the legs are naturally proportioned and well modeled. The feet were rarely indicated. The sex was usually shown but conventionally and without exaggeration of the parts.

The end post of a small mortuary house was decorated at the bottom with 346
a small caryatid figure less than two feet high. The undecorated upper part of 532
the post, which was of the ordinary triangular form, was nearly eight feet in length. No other specimens of this sort were seen and the form was probably uncommon.

CARVINGS ON POSTS

The use of house posts carved with non-naturalistic designs was quite 342
common in Hiva Oa, Tahu Ata and Fatu Hiva. Only one doubtful example of 53
post carving was seen in Nuku Hiva and Stewart's excellent description of the dwellings of that island makes no mention of this sort of decoration although he speaks of ornamental lashings (59, pp. 233-6). An informant of Ua Huka said that the house posts on that island were never carved with designs although he remembered the use of ornamental lashings and described them in some detail. It seems probable, therefore, that this type of decoration was little used in the northern islands of the group.

House posts decorated with carved designs retained their original rectangular or triangular cross section, the designs being rather shallowly incised upon the flat surfaces (Pl. XLI, *C*). Front posts were usually carved on the outer and inner sides; the lateral surfaces were left plain. Most end posts were carved on the flat inner side only, but a few were observed in which the two outer surfaces were also decorated. No two posts were exact duplicates, but all the posts from a single house showed more or less uniformity in the motifs employed. This was probably due to their being the work of a single artist.

Some of the posts had been carved with metal chisels, but originally the [illegible]
designs appear to have been hewn upon the posts with a special form of narrow-bitted adz. With this implement the artist worked free hand without a model, which accounted for the coarseness and irregularity of much of the work. The designs were never continuous from top to bottom, but were applied in horizontal zones of varying width. On a few posts there was a suggestion of an additional longitudinal division of the surface into two equal parts. The two surfaces of the outer sides of end posts were ordinarily treated as separate units. The grooves of the carving were usually semicircular in cross section, the raised surfaces between them being narrow and sharp edged. In some curvilinear designs small uncarved spaces were left, but as a rule the artist showed no appreciation of the value of plain surfaces and covered every inch of available space with carving.

In carving house posts angular-geometric and curvilinear patterns were used, but on analysis the number of motifs proved to be small. The designs in the posts studied may be given as follows:

ANGULAR-GEOMETRIC DESIGNS

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1. Straight horizontal lines. Bands of these were used to separate zones of more elaborate design and also to fill zones. This motif with its variations is shown in Figure 4, *a*, *b*, *c*, *d*.

2. Straight diagonal lines. Used to fill zones (fig. 4, *e*).

3. Series of parallel zigzag lines running horizontally (fig. 4, *f*).

4. Bands of alternate interlocking triangles (fig. 4, *g*).

5. Groups of four triangles whose bases are formed by the sides of the zone. The interiors of these triangles are filled with lines parallel to the base, lines parallel to one side, or a series of V's whose sides are parallel to those of the triangle (fig. 4, *j*).

6. Large diamond shaped figures covering the length and breadth of a zone, leaving four triangles at the corners (fig. 4, *k*).

7. Small diamond shaped figures arranged in close order to fill an entire zone (fig. 4, *h*).

8. Irregular combinations of diagonal lines (fig. 6, *d*).

The Marquesans appear to have never used checkerwork, patterns formed of groups of small triangles, or cross hatching, in their house post decorations.

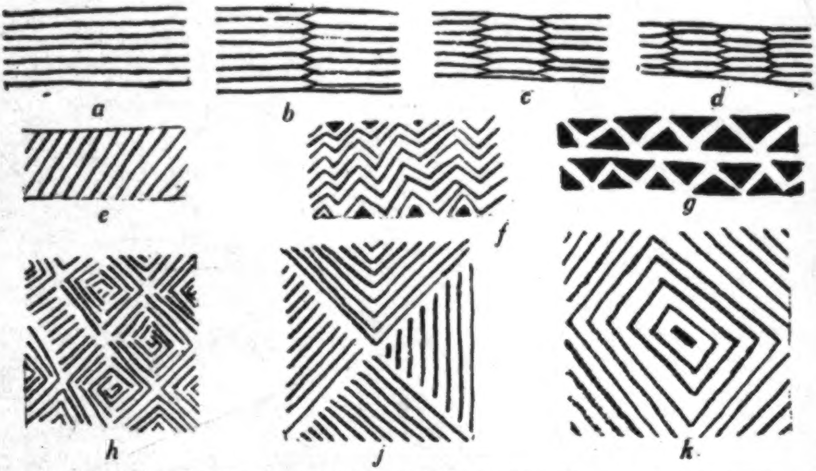

FIGURE 4.—Angular-geometric designs carved on house posts: *a*, straight horizontal grooves; *b*, horizontal grooves with length equal to one-half the width of the post; *c*, horizontal grooves with length equal to one-third the width of the post; *d*, horizontal grooves with length equal to one-fourth of the width of the post; *e*, diagonal lines; *f*, parallel zigzag lines; *g*, interlocking triangles; *h*, small diamond shaped figures. *j*, groups of four triangles; *k*, large diamond shaped figures. Reproduced from rubbings.

CURVILINEAR DESIGNS

The curvilinear designs used in house post decoration may be reduced to a few simple elements, but these are combined with each other and with angular-geometric designs to form a bewildering variety of patterns. The basic elements are:

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1. Circles, either single or in concentric series (fig. 6, *a*).
2. Ovals, either single or in concentric series (fig. 6, *b*).
3. Portions of circles and ovals, either plain or filled with lines parallel to the circumference, (fig. 5, *c*, *d*, *e*).
4. Series of parallel wavy lines (fig. 5, *b*.)
5. Irregular curves (fig. 5, *a*.)

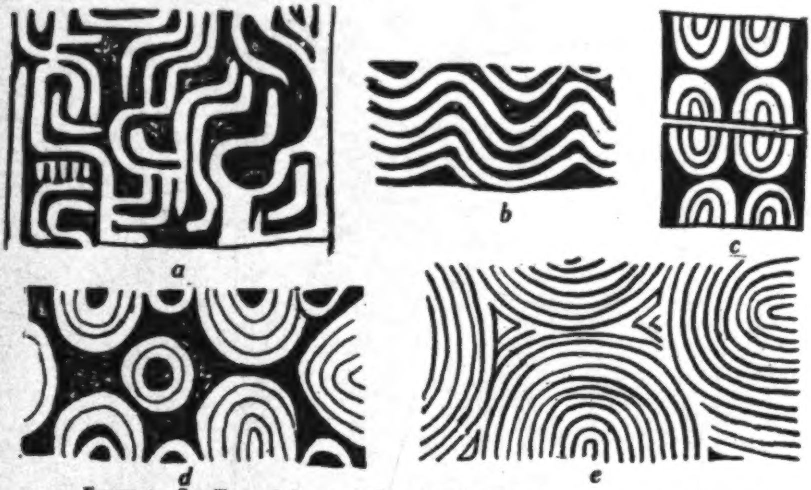

FIGURE 5.—Curvilinear designs carved on house posts: *a*, irregular curves; *c*, *d*, *e*, segments of circles or ovals; *b*, series of parallel wavy lines. Reproduced from rubbings.

When used in patterns the arrangement of these design elements is never perfectly symmetrical, although in some designs, notably those formed by four semicircles or semiovals (fig. 5, *e*), there is some approach to balance. Many of the patterns consist almost entirely of irregular curves and are completely unsymmetrical, no two elements corresponding in size or position. Interesting features of the curvilinear decoration are the complete absence of the conventionalized human faces used in all other forms of Marquesan carving and the practical absence of spiral forms.

COMBINED ANGULAR-GEOMETRIC AND CURVILINEAR DESIGNS

Angular-geometric and curvilinear designs frequently occur together in the same zone, the common arrangements being:

1. Curvilinear designs, especially concentric circles or ovals, superposed upon angular-geometric designs (fig. 6, *a*, *b*).
2. Curvilinear designs used to fill one or more of the elements of a geometric pattern.
3. Gradual transitions from angular-geometric to curvilinear designs, as in the case of some bands of parallel lines which grade imperceptably from zigzags at one end to wavy lines at the other. In all such combinations the angular-geometric motifs appear to be the basic ones.

342 An interesting feature of the house post carvings is the occasional use of toothed lines suggestive of those used by the Maori in many of their carvings. Examples of the use
531 of such lines are shown in figure 6, *c*, *e*.

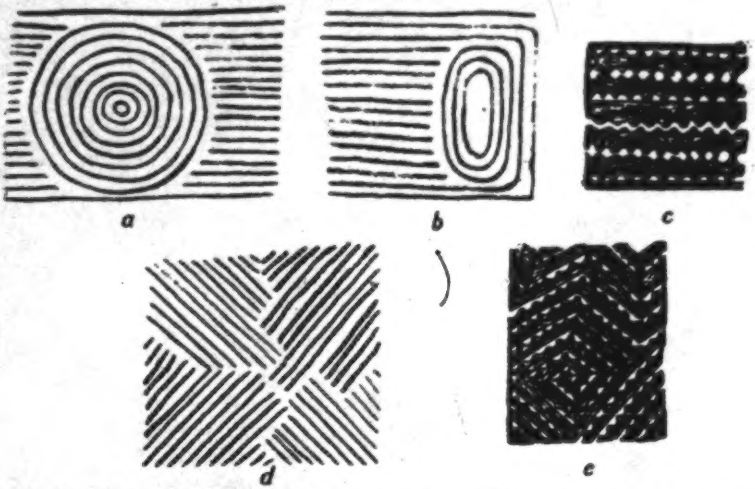

FIGURE 6.—Designs carved on house posts: *a*, circles superposed upon straight vertical grooves; *b*, ovals superposed upon straight vertical grooves; *c*, toothed lines; *d*, woven design; *e*, spiral with toothed lines. Reproduced from rubbings.

It is easy to conceive of the development of house post carving from an appreciation of the esthetic value of the adz marks left after the dressing of the timber. In ~~many~~ objects which are not actually carved these marks are arranged with evenness and regularity and give a decidedly ornamental effect. What may be considered as a intermediate stage between such adzing and actual carving was observed in a set of end posts from Nuku Hiva and another from Fatu Hiva. The inner surface of these posts had been adzed into a series of horizontal grooves six to eight inches wide with a maximum central depth of one-half inch, the ridges separating the grooves being narrow and sharp. The transition from such ornamental adzing to the simpler geometric designs would be easy.

ORNAMENTAL LASHINGS

342 Ornamental lashings were probably more commonly used as decorations
531 for the house than carvings, but because of the perishable nature of the ma-
284 terials few examples have survived. The material employed for lashings was a

The material employed for lashings was a flat three-strand sennit plaited from coconut fiber. This fiber was obtained from 342
both the husk and the leaf sheath. The sheath fiber was considered the better, prob- 531
ably because its greater length rendered possible a smoother plait. The only colors 284
seen were a dull black and the natural red brown, but Stewart (59, p. 236) men- [824]
tions the use of yellow and white sennit as well. The plaiting and dyeing of this sennit have been described on pages 378 and 379.

The only complete set of ornamental lashings seen in the Marquesas was in an old house in the valley of Atu Ona, Hiva Oa. The lashings were applied to the juncture of the three main rafters of the front roof with the ridge pole, to the junctures of all the rafters of the front and rear roofs with the lowest crosspieces, and to the junctures of the main rafters of the rear roof with a squared beam which ran along its under surface at the height of the top of the front wall. This top beam probably did not exist in really primitive structures. According to informants, ornamental lashings were used for the attachment of the front posts to the stringer, of the main rafters of the front roof to the stringer, and of all the cross poles of the roof to the rafters. Stewart (59, p. 236) says that the front posts were "generally neatly hewn and ornamented by braids of sennit . . . tied on in horizontal stripes in diamonds or in checks, in a pretty and fanciful manner." As the front posts in Hiva Oa, Tahu Ata and Fatu Hiva were usually carved this was probably a Nuku Hivan practice. The posts of houses in Nuku Hiva are also said to have sometimes been covered with white tapa under the lashings.

A considerable number of lashing designs were employed but their use has been discontinued for many years and only two patterns were seen. These appeared on different parts of an old house in Atu Ona. According to informants the designs used for house lashings were made by a special *tuhuna* who originated them from string figures. Different designs were used for the front posts, the rafters, and for other structural parts. Another special *tuhuna* put them on. The designs seen were ovals with a black center and brown rim, used at the points of attachment of the small rafters and the cross pieces of the front and rear roofs (Pl. XL, *F*), and crosses with a band on either side, used at the juncture of the main rafters with the lowest crosspiece. At the juncture of the central rafter of the front roof with the ridge pole two of these designs were placed side by side.

METHODS OF MAKING LASHINGS

The methods of making lashings may be described as follows:

For the oval lashings two cords were used, one of black and the other of brown sennit, both being carried from the left along the top of the crosspiece. The black cord was passed twice around the rafter to form a double hitch whose upper and lower loops were respectively above and below the crosspiece. The cord was then turned back to the left, carried up the

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left side of the juncture of the rafter and crosspiece, and around the rafter just above the crosspiece from right to left. The half hitch was tightened and the strand brought into a vertical position on the outside of the crosspiece. The loose end was then passed across the vertical strand as close to the rafter as possible, down its right side, across it again at the bottom, and behind the rafter from left to right. The flatness of the sennit cord prevented this loop from slipping over the vertical strand. The cord was carried across the original strand and the first loop as close to the rafter as possible, up the left side of the original strand, and across the original strand and first loop at the top, close to the rafter. The cord was then passed behind the rafter from right to left. This was repeated until the oval had a width of five strands at the center. The end of the cord was then at the upper left hand corner of the figure. It was passed across the lashing in front of the rafter, down the right side of the lashing behind the crosspiece, across its bottom and up its left side behind the crosspiece. This completed the black part of the figure. The strands were pulled taut and the black cord carried on in front of the rafter to the next rafter to the right.

The brown cord, coming from the left, was brought across the top of the black lashing in front of the rafter, down its right side behind the crosspiece, across to the left, and around the rafter from left to right. The end was then at the lower right hand corner of the figure. Two loops up, around the rafter, and down on the opposite side of the figure were then made, the method being the same as that used with the black cord. This gave to the oval a width of nine strands, the two outer strands on each side being brown and the rest black. The cord was then carried across to the left, up the left side of the lashing behind the crosspiece, and across the lashing again at the top, with the end carried on to the next rafter on the right.

The cross lashing was much more complicated. It can be made as follows: Bring the black cord from the left along the top of the crosspiece, pass it around the rafter from right to left, down over the crosspiece, around the rafter from left to right, up the left side of the rafter behind the crosspiece, and through the upper loop. Tighten lashing, pass the end down the left side of the lashing behind the crosspiece and up, over the front of the crosspiece, placing it close against the original outside strand on the left. Pass the end downward behind the rafter diagonally to the right, bringing it out at the lower right corner. Bring it up over the crosspiece diagonally to the left, around the rafter from left to right and diagonally down over the crosspiece right to left. Carry it behind the rafter from left to right, across the front of the rafter, and up the left side of the lashing behind the crosspiece. Wrap twice around the crosspiece and pass the end around the rafter below the crosspiece from left to right. Bring it up diagonally over the crosspiece from right to left, placing the cord close against the left side of the first diagonal. Pass the end around the rafter left to right, and bring it down over the crosspiece diagonally to the left. Pass around rafter left to right, across to left in front of rafter, and up left side of lashing, behind crosspiece. Leave black.

Bringing the brown cord from the left pass it over the black lashing below the crosspiece, up the right side of the lashing, back to the left, and under itself from the rear. Pull the loop tight. Pass the brown cord twice around the crosspiece, taking care to have these strands lie on the left of the four black strands already in position and close against them. Pass the end around the rafter above the crosspiece from right to left, diagonally down over the crosspiece from left to right, around the rafter from right to left, up over the crosspiece diagonally to the right, and around the rafter from right to left. Leave brown.

This finishes the first half of the figure, and should give a vertical band of six strands, the two strands on the left being brown, which has on its right an X figure with arms three strands in width, the first strand on the left side of each arm being brown.

Take up the black cord, which was carried up the left side of the lashing behind the crosspiece. Carry it across the lashing in front of the rafter, down the right side of the lashing, across the lashing again, and up behind the rafter diagonally left to right, the end emerging at the upper right hand corner. Bring it down over the crosspiece diagonally right to left, around rafter left to right, and up diagonally over the crosspiece right to left. Pass it down behind the rafter diagonally left to right. Wrap it twice around the crosspiece. Carry the end across the lashing below the crosspiece to the left, and up diagonally behind the rafter, emerging at the upper right corner. Bring it down over the crosspiece diagonally to the left, around the rafter left to right, and diagonally up, right to left. Pass it down behind rafter diagonally, emerging lower right corner, and wrap it twice around the crosspiece. Carry end across lashing below crosspiece to the left, up the left side behind the crosspiece, and across the lashing to the right, in front of rafter. This completes the black part of the lashing. 342 531 284

Take the brown cord, which has been carried around the rafter from right to left above the crosspiece, and carry it down over the crosspiece diagonally from left to right. Pass it around the rafter right to left, and diagonally up over the crosspiece left to right. Bring it down behind the rafter diagonally right to left, across the lashing below the crosspiece to the extreme right edge of the figure, and wrap twice around the crosspiece. Make one complete turn around the rafter below the crosspiece from right to left, carry up the right side of the lashing, across to the left, down left side and carry on to next figure on right.

The complete lashing should consist of two vertical bands each of six strands, the two outer strands in each band being brown and the four inner black. Between these there should be an X whose arms are six strands in width, the two strands along the edges of either arm being brown and the four central strands black.

OTHER FORMS OF DECORATION

No indication of the use of paint in the decoration of house timbers was found, and no reference was made to it by informants. Du Petit-Thouars (48, p. 347), however, speaks of seeing in the island of Tahu Ata, a small house, with posts painted red and yellow, which sheltered a corpse. This form of ornamentation was probably never used for dwellings. 342 531

Informants in Pua Ma'u, Hiva Oa, stated that men's houses belonging to chiefs were often ornamented with the lower jaws of wild pigs, several of them being attached to the inner side of the front stringer at regular intervals. The jaws were placed angle up, with the tusks projecting below the stringer. These tusks were useful as well as ornamental, serving as hooks on which to hang small objects.

The early accounts of the Marquesas contain several references to prepared skulls which were used to decorate the houses of victorious warriors, but no details of the arrangement are given and as such trophies were also worn as ornaments it seems probable that they were simply hung up in the house and not incorporated in the structure. [727]

HOUSE FURNISHINGS

Although furniture, in the European sense, was lacking, miscellaneous objects were to be found in any inhabited Marquesan dwelling. The bed space was covered with mats; wooden bowls and boxes lay about; calabashes and baskets hung from the walls or ridge pole; and tools and weapons were hung up or were thrust into the thatch. Porter (49, p. 113) says that there were "stands, calculated to hang different objects on, so contrived that the rats could not get them" and "cradles for their children, hollowed out of a log and made with great neatness." No other reference to these cradles has been found. From the ridgepole hung a number of bundles containing new tapa, or the gala dresses and 352

352 valuables of the occupants. As a protection from rats the cords by which the bundles were suspended passed through inverted gourd shells. The cords passed over the ridgepole and were tied at a convenient height so that to get a bundle it was only necessary to loosen the cord and lower away. The whole house was kept scrupulously clean and formed a healthy and agreeable dwelling.

SPECIAL HOUSES

343 In addition to the houses of the two main types already described, the Marquesans appear to have built a few special structures of slightly divergent form. No buildings of these minor types have survived; they must be reconstructed from the fragmentary accounts of informants.

The storehouse was not built on a *paepae* but was raised above the ground on four to six posts. It stood near the dwelling *paepae*, preferably at one end, and its floor was at about the same level as that of the house. It was a small structure shaped like a dwelling, but the use of a raised floor must have necessitated minor changes in construction which can not now be ascertained. The floor was made of fau poles. In the better storehouses the posts and frame work were carved and there was a liberal use of ornamental lashings. The house was used for the storage of tapu articles and was sometimes used as a residence by old men. It was tapu to women. The native name for this house was *fata'a,* a word whose resemblance to the Maori word *pataka* (applied to small elevated storehouses) is obvious.

346 Fisherman's houses were built within the precincts of the fishermen's sacred place. In Atu Ona, Hiva Oa, these houses were of special form according to information obtained by Handy (32). They were raised on posts like the *fata'a* already described. The floor was of fau poles and the roof was of the small house type. The ends of the house were closed and in one end, a small rectangular door was built. These houses must have been a local development, for the fishermen's houses in the valley of Pua Ma'u, on the same island, were not of this type.

Fae tukau were sacred structures erected in *me'ae*. They are mentioned by Gracia (28, p. 57) and by Porter (49, p. 111). Porter describes them as follows: "To the right and left of these gods are two obelisks, formed very fancifully and neatly of bamboos and the leaves of the palm and coconut trees interwoven. The whole is handsomely decorated with streamers of white cloth which give a picturesque and elegant appearance. The obelisks are about thirty-five feet in height."

According to information obtained by Handy (32) in Pua Ma'u, Hiva Oa, these houses were built by the *taputoho,* a revenge victim (*heana*) being sacrificed and eaten as part of the ceremony. The house itself appears to have been of the ordinary dwelling type modified by greatly increasing the height of the roof. One house of this sort in Pua Ma'u is said to have been "three fathoms long, three fathoms wide, and ten fathoms high," but the height at least is almost certainly exaggerated. The end posts were made of several pieces of lumber spliced one above another and placed like those of an ordinary dwelling. There were three front posts. The front was open. The roof was thatched with breadfruit leaves and decorated with figures of birds made from red tapa and split bamboo, between which were placed *koufau* (bundles of sticks). There is said to have been a bird figure for every fathom of height. Within the house there was a *fata'a* called the *ananu'u*. The only other objects in the house were three pieces of wood placed one on the *fata'a*, one half way up the house, and another at the top. Each of these pieces of wood was decorated with four designs called *tava* which were so arranged as to form an open square. A *taputoho* lived in this house. 346 [824

Tona Pou were houses tapu to women in which the men assembled to chant the *pue* (name chant). They are said to have been raised above the ground on posts and, according to Handy (32), were like the *fata'a* except for their larger size.

Canoe houses appear to have been purely utilitarian and did not exist in certain valleys because of the practise of carrying the canoes up into the *tohua* (assembly place) or of dismembering the canoes and distributing the parts among the various owners. They appear to have been most common in valleys having good beaches and the sites of the canoe houses in Pua Ma'u, Hiva Oa, are still remembered. An old man there, who had seen some of these structures, said they were open at one end, like the modern boat houses, but he could give no details of their construction. A modern house in the valley of Hatiheu, Nuku Hiva, suggested a possible form for these structures. One end of this house was like that of an ordinary dwelling. The other end was open. Two heavy posts of equal height were planted on either side. Their tops were connected by a heavy curved beam, convex side up, from the center of which a short vertical timber extended to the peak of the roof, supporting the ridgepole. 349 504

SUMMARY

The Marquesans employed two main house types, the canoe houses possibly forming a third. The simpler houses consisted of a roof resting upon the ground, while in the larger and more elaborate the roof was raised on one side only. Houses of the second type were normally built on terraces or platforms of stone which were often of considerable height. They were used as dwellings and sacred structures. When used for ceremonial purposes some of them were modified by 342

342 raising the entire house on posts, or by making the roof of disproportionate height. Houses of both types appear to have been used in all the islands, but the larger type shows more or less local variation in the form of the *paepae*, in size, and in decoration. In Nuku Hiva and Ua Huka the *paepae* was as a rule much wider in proportion to its length than in the islands further south and in Nuku Hiva many *paepae* were provided with a pit for tapu objects. The use of cut stone as edging for the house floor, although of sporadic occurrence in all the islands, was most frequent in Nuku Hiva and least frequent in Fatu Hiva. The decoration of the dwelling *paepae* with ornamental masonry appears to have been limited to Nuku Hiva, and its decoration with stone figures, to Hiva Oa, with a single doubtful example from Nuku Hiva. As a class the houses of Nuku Hiva were the largest in the group and those of Fatu Hiva, the smallest and most poorly built. Carved posts are said never to have been used in the dwellings of Ua Huka, were rare in Nuku Hiva, but were very common in Hiva Oa, Tau Ata and Fatu Hiva. Ornamental lashings were used everywhere in the Marquesas, but appear to have played a more important part in the decoration of houses in the northern than in the southern part of the group.

COMPARISON OF POLYNESIAN HOUSES

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Structures corresponding to the Marquesan small house type (p. 271) are of rather wide occurrence in Polynesia. They are recorded from Hawaii, where they represent the original form from which the other house types were developed. They are also found in Tonga and in the Society Islands. The dwelling house type, as described on page 272, is characteristic of the Marquesas, and so far as known is peculiar to that group of islands.

It seems probable, therefore, that the original settlers of the Marquesas brought with them a knowledge of the small house type and that the dwelling type is a later local development. The small house, while easily made, was inconvenient on account of the lack of head room and the large amount of waste space under the edges of the roof on either side. To develop the dwelling type from the small house type it was only necessary to raise the roof on one side and prop it up with posts placed along the outer edge. Even now small houses are occasionally enlarged in this way. The use of a stringer along the front of the house to keep the rafters from sagging between posts would be a step requiring no great inventive genius, while an increase in the pitch of the rear roof, cutting down the waste space along its lower edge, would soon follow. The complete absence in the Marquesas of houses with both front and rear walls is rather curious as the natives were in occasional contact with the Tuamotus and Society Islands, where walled houses were in regular use.

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On the basis of house type, Polynesia as a whole may be divided into two parts: a central part, including Tonga, Samoa, and to a lesser degree the Society Islands, in which the houses were oval, with rounded apses; and a marginal portion including New Zealand, the Marquesas and Hawaii, in which the houses were rectangular. In the central section there was no distinction between floor space and bed space, and the platform was unimportant. Some of the houses were furnished with wooden stools. Legged pillows of wood or bamboo were in regular use. In the marginal section there was a permanent division of bed and floor, a stone platform was used everywhere but in New Zealand and there was no furniture.

The Marquesan house had little in common with the central Polynesian type, and appears to be intermediate in form between the two varieties of the marginal type—that is, the Maori and the Hawaiian. In the arrangement of the frame and the common use of a stone platform and side entrance, it resembles the Hawaiian form. On the other hand the use of carved decoration links it with the Maori form, as does also the occurrence of a slide door. The *fata'a,* or store house on poles, finds no parallel in Hawaii or central Polynesia, but it closely resembles the Maori *pataka.* The use of ornamental lashings is absent in both Hawaii and New Zealand, but is highly developed in many parts of the central area. The best explanation for these facts appears to be that the Maori, Marquesan and Hawaiian forms are descended from a common ancestor, but that the Maori and Marquesan houses have been affected by some influence which introduced house carving and the *fata'a* type of structure, an influence which did not reach Hawaii. The Marquesan houses were then further modified by the introduction of ornamental lashings, a feature which did not reach either Hawaii or New Zealand.

CANOES

501 [177] For convenience in description, Marquesan canoes may be considered as of two main classes, modern forms, all of which show more or less European influence; and ancient, or genuine, Marquesan forms. The modern canoes are of two sorts, small fishing canoes and the form called by the natives *vaka poti* (literally, canoe boat), which is a hybrid of the European boat and the native canoe. Only two types of ancient canoe are remembered by the present natives, a small fishing canoe closely resembling the modern one, and a large war canoe. Double canoes, as described by informants, cannot be said to constitute a distinct type. Porter (49), who gives a very good account of the canoes used in Nuku Hiva at the time of his visit in 1813, describes a third type, all memory of which seems to have been lost. He also mentions a form of large double canoe used for long voyages.

MODERN CANOES

FISHING CANOES

501 396 Small fishing canoes are still in constant use throughout the Marquesas. Their structure and method of manufacture may be described as follows:

[824] They range from twelve to eighteen feet in length with a beam of one foot to eighteen inches and a depth of about eighteen inches. The body of the canoe is hewn from a single log of breadfruit wood which is usually peeled and allowed to season for a time before shaping, but the making of some canoes begins as soon as the tree is felled. The shaping of the outside is completed before the excavation is begun. When the log has been roughly excavated with an ordinary steel axe, a short handled adz with a semicircular cutting edge is used to complete the dressing. The natives are remarkably expert in the use of these adzes, and the cuts left by them are as regular as though made by machinery, even on surfaces that will later be rubbed smooth. The outside of the canoe is rubbed down with sand paper after shaping until all the adz marks are obliterated. In the finished body, the sides are three-quarters of an inch to an inch thick, and the bottoms are from an inch to an inch and a half thick. The sides run parallel for most of the length, beginning to taper inward two to three feet from either end. The bow and stern are indistinguishable, the bottom curving up for about one-third the depth of the body and passing imperceptably into a straight cutwater. After the body is completed, two holes are bored through each side directly opposite about two inches below the gunwale edge and about three feet from the bow and from the stern. Round pieces of hard wood about three-quarters of an inch in diameter and seven inches long are then driven through these holes forming plugs which are used in the attachment of the outrigger. Two half-inch planks, four to six inches in width, are then placed outside the body, their lower edges resting upon the projecting plugs, and are gradually bent inward at either end, following the curve of the body, until they meet at the bow and stern. The ends of these planks are sawn diagonally to make the joint as tight as possible. These planks are nailed to the body of the canoe and to each other. Small triangular pieces of plank, resting upon the top of the dugout underbody, are usually inserted at bow and stern, forming a short deck at either end. Ordinary commercial hard pine is used for these and for the side planks. No caulking is used; the joints between the body and the sides planks are sealed with several coats of paint.

All canoes are provided with outriggers. The form now in use, which has replaced the original form throughout the group, is known to be the invention of a mulatto who settled in the valley of Tahauku, Hiva Oa, a few years ago. The rapid dissemination of this invention

> indicates the speed with which new appliances of obvious value are accepted by the natives. 501
> The new outrigger is indirect, and consists of three elements, the float, the uprights, and the
> crosspieces. The float consists of a peeled log of fau wood four to five inches in diameter, 396
> slightly shorter than the canoe. This is usually sharpened at the forward end only, the cutting [824]
> being done entirely from the lower side, but a few specimens were seen which had been sharpened at both ends, apparently with the idea of making the canoe completely reversible. The uprights, about two feet long, are usually made of small barrel staves. A triangular notch about two inches deep is cut in the upper end. Eight inches below this notch the uprights are pierced by a rectangular hole an inch and a half to two inches square. These uprights are permanently attached to the float. The unnotched ends of the staves are wedged into longitudinal slits near either end of the upper surface of the float. The crosspieces are peeled poles of fau or hard wood about eight feet long and three inches in diameter at the butt. Their outer ends are sharpened so that they will readily pass through the rectangular holes in the uprights.
>
> The outrigger is assembled and attached as follows: The squared ends of the cross poles are fitted into the holes of the uprights, their points projecting about two inches on the outer side. The whole outrigger is then placed on the right side of the canoe, the crosspieces extending across it on the line of the hard wood plugs, with their butts projecting a few inches beyond the left gunwale. One end of a light rope is then fastened to the projecting end of the front crosspiece, outside the upright. The rope is then carried over the top of the upright, through the notch, and along the crosspiece to the inner side of the right gunwale. It is then passed back and forth diagonally over the crosspiece and around the inside and outside ends of the plug until the crosspiece is held rigidly. The rope then runs along the crosspiece to the left gunwale, where the same lashing is repeated. Some slack is then left in the canoe, and the left end of the rear crosspiece is lashed, the rope passing from there to the right gunwale lashing the crosspiece there, and out along the crosspiece and over the end of the upright to the outer end of the crosspiece, where it is tied. Any rope left over is carried back along the crosspiece and coiled in the canoe.
>
> An outrigger of this sort can be attached or removed in a few moments, and the single rope used to lash it is available for other purposes when not in use on the canoe. When a canoe is beached the owner usually removes the outrigger at once and stores it in a safe place, thus making the canoe useless and safeguarding it from theft.

Small fishing canoes of the type described are rarely used for trips of any 502
length. They are not sailed but are commonly paddled by two men. One man sits on the stern crosspiece of the outrigger where it crosses the boat, while the other wedges himself between the thwarts amidships. Most of these canoes are completely reversible, and they are sometimes paddled with the outrigger on the left instead of the right. The narrowness of these craft, and their high center of gravity (for the paddlers sit practically on top of the canoe) make them very unstable, and in spite of the outrigger they frequently capsize. The natives right them by getting on the outrigger and forcing it down under the canoe and up the other side.

VAKA POTI

The *vaka poti*—a craft that appears to be a local development—is an inter- 501
esting example of the native adaptation of European ideas. It may be described as follows:

501 396 [824] As the name indicates, the *vaka poti* is a hybrid of canoe and boat, and is larger and more seaworthly than the fishing canoe, being twenty to twenty-five feet long with a maximum beam of two to two and a half feet. A long strip of breadfruit or temanu wood, eight inches to a foot in width, about four inches thick and tapering to a point at both ends, serves the double purpose of keel and bottom. It is smoothly rounded on the outside and slightly hollowed along the center of its upper surface. This is probably an extreme modification of the dugout underbody of the old built up canoes. Longitudinal slots are cut in either end of this keel and into these two flat, slightly curving pieces of temanu wood are bolted. These serve as the stem and sternposts of the boat, and are identical in form. Short light ribs are then bolted to the keel along both edges, their short lower arms resting upon its upper surface. The sides of the boat are built up with thin planks of commercial lumber which are laid on with an overlap from above downward—that is, the boat is clinker built. These planks are carefully dressed along the points of contact to insure a tight joint, and are fastened into grooves in the sides of the stem and sternpost. The gunwales are finished with a narrow flat strip of wood. At either end of the boat, immediately below this strip, a triangular piece of plank is put in, decking the last two or three feet of the bow and stern. The boat is braced by three broad flat thwarts which also serve as seats. One of these thwarts is placed in the middle and the other two at either end, two to three feet within the edges of the end deckings. The forward thwart is pierced with a hole three or four inches in diameter which, with a corresponding block on the keel, serves to step a mast. These crafts are always provided with an outrigger similar in shape and attachment to that of the fishing canoe, but of proportionately greater size.

Alexander, who visited Nuku Hiva in 1899, saw a slightly different form of outrigger in use with the *vaka poti*. He says (2, p. 746): "From the gunwale to the outrigger float of these canoes is an average of 7 feet. The outrigger frame consists of five pieces of wood, namely, two poles or crosspieces seized across the gunwales 4½ feet apart, one forward and the other aft of center; two stanchions connecting crosspieces of the outrigger float, and a brace which is seized to crosspieces just outside the gunwale. That part of the crosspieces between the gunwales answers the purpose of thwarts, the upper side being hewn to a flat surface. The outboard ends are sized to the perpendicular pieces, or stanchions, the length of which is, as a rule, the distance from the gunwale to the water line. These pieces are sized to the top side of the float, the sizings extending all the way around the float, but done so neatly as to offer little resistance to the water. The crosspieces, float, and stanchions are braced with withes to prevent them from being twisted and thrown out of position by coming in contact with rocks. . . . The material used in sizing the outrigger frame together is coconut fiber twisted into a small line." [924]

[502] A *vaka poti* is normally handled by four men, one of whom sits in the stern and steers with a paddle while the other three row with short oars of ordinary European form. The bow and stern oars are placed on the side opposite the outrigger, the middle oar on the outrigger side, working within it.

Every craft of this sort is provided with a leg of mutton sail of canvas like that commonly used on ships' boats. When not in use the sail is stored under the short deck at one end of the boat, while the poles which serve as mast and boom are lashed along the crosspieces of the outrigger. The heavier of these poles, which is about nine feet long, serves as the mast. When the sail is to be hoisted, the mast is passed through loops of string tied along one edge of the sail, the loop nearest the masthead being firmly tied to the pole. Two light ropes are then attached to the masthead opposite each other and the mast is stepped, the butt passing through the hole in the forward thwart and resting in the hollowed block in the keel. The two ropes from the masthead are then fastened to the forward outrigger crosspiece just outside the gunwales of the canoe. A third rope is sometimes run from the masthead to the prow, but this is not common. The lighter pole serves as the boom and passes through the loops along the lower edge of the sail. The outermost loop is firmly tied to the boom, and a rope is attached to its outer end. The boom is then gradually thrust outboard until the sail is fully spread and only the inner end of the boom rests against the mast. This end simply rests against the mast and is not attached to it.

Vaka poti are rarely if ever used for inter-island voyages as most of the villages possess whale boats, which are more suitable for such trips. The natives, however, make fairly long coasting voyages in the *vaka poti*. They keep as close in shore as possible, rowing along the edge of the breakers in the narrow belt of comparatively calm water caused by the backwash from the cliffs. Even when there are large bays along the route they prefer to skirt the shore rather than to cut straight across. This custom of lying close inshore no doubt accounts in part for the indifferent way in which the boats are sailed. When the wind is astern the sheet is paid out on the side away from the outrigger, and as there is no way of reefing in case of a strong wind it is necessary for the occupants of the canoe to lean far out on the outrigger side or even climb out on the outrigger frame to keep the boat from capsizing. When the wind is on the port quarter the sheet is paid out on the outrigger side, but it is dangerous to sail this way as a sudden puff may drive the outrigger under and capsize the boat. When the wind is abeam the natives lower sail and row out against it for some distance, then spread sail and come in at a long slant with the wind on the quarter, repeating the maneuver whenever they get too close to the coast. They do not seem to understand tacking, and never sail except with a following wind. 502

ANCIENT CANOES

THE DUGOUT

Two ancient types of canoe are remembered by the natives, a small fishing canoe, and a built up war canoe. The small canoe is said to have been a simple dugout, identical with the modern fishing canoes already described except that it lacked the plank gunwales and had an outrigger of the ancient form (p. 309). Porter (49), who mentions these canoes, says that they were "commonly nothing more than the hollowed keels of the large ones after the upper works have been taken off." They appear to have been used only around the harbors, all longer voyages being made in canoes of the built up type. 501

BUILT UP CANOES

Large built up canoes have been obsolete for many years, as the Marquesans were quick to see the superiority of the European small craft and soon learned to imitate them. Even in 1838 Du Petit-Thouars (48, p. 348) says that the ancient canoes had been largely replaced by whale boats which the natives obtained from passing ships. Small built up canoes have, however, continued in use until comparatively recent times and a seaworthy example is still to be seen on the island of Fatu Hiva. The form of these smaller craft is well remembered by many living persons and from their descriptions, the numerous early [177]

501 accounts and the fragmentary examples surviving in various parts of the group,
it is possible accurately to reproduce the type.

Four species of wood were used for the large canoes *mio* (*Thespesia popul-*
501 *nea*), temanu (*Calophyllum inophyllum*), breadfruit, and hutu (*Barringtonia*
324 *speciosa*). The hutu was considered least desirable. *Mio* was rarely used, as
large trees of this species were rare and the wood was in great demand for other
purposes. Breadfruit wood was usually used for the smaller and poorer boats,
while the best craft were made of temanu. Even at the present time there is some
very large timber in the Marquesas (one temanu tree over ten feet in diameter
was seen) but there is no native tree which produces a long straight stick at all
comparable to the New Zealand kauri, and in very large canoes it was usually
necessary to make the underbody in two or more sections which were dovetailed
together.

Before the introduction of metal very large trees were felled with fire, but
396 the shaping and hollowing appears to have been done entirely with tools. From a
313 chant collected by Handy (personal communication) the tree appears to have been
322 stripped of its bark and possibly of its branches before felling. The shaping
was begun as soon as the tree was felled, the green wood being tougher and
more easily worked. The tools used were stone adzes of various sorts, chisels
and rubbing stones. (See chapter on Stone Artifacts.)

396 The building of large canoes was in the hands of *tuhuna* (skilled workmen)
who merely supervised the work, leaving the actual labor to the friends and rel-
501 atives of the owner. According to informants in Pua Ma'u, Hiva Oa, four hun-
dred men (probably an exaggeration), under the direction of four *tuhuna*, were
employed upon the last war canoe built there. The work was all done at the place
where the tree had been felled, which in this case was high up the valley. Here a
large decorated house was built for the workmen, who lived there with the direct-
ing *tuhuna* and were fed by the chief for whom the canoe was made. Twenty
men are said to have been required to gather the food. The place was tapu to
women and to all natives from other valleys. According to an informant from
another valley some famous warrior slept in the unfinished canoe body every night
in order that his mana might strengthen the wood and keep it from splitting.
The completed canoe was carried down to the beach, probably in sections, and
launched. [For an account of the ceremonies attending canoe building and
launching see Handy (32)]. In Pua Ma'u the war canoes were kept assembled in
396 special houses at the beach. These houses were undecorated and appear to have
501 had no ceremonial significance beyond the fact that they were tapu to women.
552 Each war canoe was named, a new canoe was given the name of a former one

which had been worn out or damaged. The names of the Pua Ma'u canoes were 396
Vaimakamaka, the largest and most important, Vaioto, Taipehe and Meaupiau. 501

The canoe normally consisted of nine parts, the underbody, bow piece, stern [552]
piece, two side planks, and four strips used to cover the side seams. Certain other parts were occasionally added. Each of the large sections was usually hewn from a single piece of wood, while the strips were made of bamboo.

The underbody of one large canoe and part of a second underbody, which had been made in two pieces, were seen in the valley of Hakaui, Nuku Hiva. The history of these objects had apparently been forgotten by the Hakaui natives, but according to Atu Ona informants one of the underbodies belonged to a canoe called Mo'ote which was made in that valley by a *tuhuna* named Kaneautia. This canoe was sent to the chief of Hakaui by a chief of Atu Ona in exchange for *enamoa*, a yellow paint or dye used for anointing the body, prepared in Nuku Hiva by a secret process. The debris of a great temanu tree from which this canoe is said to have been made is still to be seen in Atu Ona.

Hakaui informants said that the two underbodies had belonged to separate craft, not to a single double canoe. On the other hand Christian (10, p. 180) mentions two old canoes in this valley which, from their location, seem to be the same as those here referred to and gives a photograph of a large double canoe, unquestionably Marquesan, which he implies belongs with the reference. In this photograph each of the canoes appears to be complete in itself while the attachment consists of three cross poles, easily removable. It seems probable, therefore, that these canoes were used both singly and together.

A study of the complete underbody—which had been exposed to the weather and was much rotted and warped—brought out the following particulars:

It was 40 feet, 6 inches in length, with a maximum central width of 4 feet, which tapered to 2 feet, 6 inches at the ends. The original depth could not be accurately determined. The two ends of this underbody were identical.

The section of an underbody was much better preserved, having been stored under an overhanging cliff which protected it from the weather. If the underbody of which this had formed a part was similar to the complete specimen it must have been over 60 feet in length. Some old canoe models, which appear to be very accurate, clearly show that the two ends of underbodies were not always the same, the forward end often being made much broader and deeper to facilitate the firm attachment of the bow piece. The extreme shallowness and narrowness of the outer end of the section proves that it was the stern, and if we assume that the whole underbody was of the broad bowed type it is possible that it was not more than 40 to 45 feet in length. The dimensions of the section were as follows: Length 34 feet, 11 inches; maximum width (at a point 4 feet from the inner end of the section) 3 feet, 4 inches; width at stern, 1 foot, 6 inches; maximum depth (outside) 1 foot, 9 inches; depth at tip of stern 4½ inches. The walls were 1½ inches thick at the upper edge, increasing gradually to 2¾ inches in the center of the bottom. The cavity of the underbody had, in cross section, the form of a rectangle with rounded corners. The middle of the canoe was flat bottomed, becoming gradually more rounded toward the stern.

396 501 The rim of the underbody was flat and straight throughout its length, except for the last six feet of the stern where the walls of the underbody were thickened to form a longitudinal ridge about two inches below the upper edge. (See Pl. XLII, *A*.) The lower part of this ridge curved smoothly into the contour of the bottom, while the upper part ran back in a flat bevel at an angle of about 40 degrees to the line of the outer edge of the flat rim. The bow and stern of all underbodies appear to have been finished in this way. The tip of the underbody was cut squarely across, and the outside was flat and vertical. The rim was somewhat broader here than along the sides and had, in the center of its interior surface, a broad, rounded point, left at the time of its excavation. This feature is shown in small canoe models, and both the bows and stern of underbodies were probably finished in this way. The projection corresponded to a similar projection on the under surface of the stern and bow pieces, and no doubt helped to strengthen and make rigid their juncture with the underbody.

The inner end of the canoe section observed at Hakaui was especially interesting as it showed the method of finishing a joint. The bottom was cut squarely across, and had no holes for lashings. The sides were cut back for a distance of two feet, the lower edge of the cut sloping upward gradually until its perpendicular inner end was only eight inches high. The surfaces of the side cuts were beveled, running to a thin edge on the inside, and were pierced with triangular holes for lashings. (See Pl. XLII, *B*.)

A row of similar holes was pierced through either side of the underbody about an inch below the rim. There were no holes at the ends. The lashing holes were an inch and a half in width and approximately an inch in depth, the base of the triangle being upward, and were placed at intervals of five to six inches.

Along each side of the section there was a row of three small projections which had been left at the time the canoe was hollowed out. These projections were six inches wide and five and a half inches high, the upper edges were two inches below the rim of the underbody. They had been carved into the form of squat human figures with disproportionately large heads, but the details had been practically obliterated. The projections were arranged in pairs, facing each other; the interval between pairs was 9 feet. 11 inches. The natives could give no information as to their purpose, but it seems certain that they served as supports for thwarts or seats. The complete underbody had no projections of this sort and these projections do not appear in any of the models studied.

224 Both underbodies were made of temanu wood and had been carefully rubbed down inside and out, obliterating all tool marks and giving the surface a finish as smooth as that of an ordinary bowl.

THE BOW PIECE

So far as known no bow pieces of Marquesan built up canoes have survived but excellent descriptions which check up with the accounts of early voyagers and the old canoe models were obtained from informants.

In a canoe with a forty-foot underbody the bow piece would be about fourteen feet long. Its shape (difficult to describe) can be seen from the accompanying photograph of a section of an old and apparently very accurate canoe model (Pl. XLIII, *A*). For the sake of convenience in description the bow piece may be divided into three parts, the deck, the neck and the figurehead. The deck was the rearmost section, which was enclosed between the ends of the side planks and bounded in front by a transverse flange, the breakwater, which kept head seas from entering the canoe. The deck of the bow piece was of the same width as the underbody, with a flat upper surface and vertical sides. The under surface was deeply hollowed, the lower edges being of the same width as the sides of the underbody upon which they rested. Triangular lashing holes were pierced through the sides a short distance above the lower edge, while two other holes, one on either side, were pierced through the angle formed by the top and sides about half-way between the breakwater and rear end of the deck. The upper lashing holes, which served for the attachment of the ends of the side planks, did not pierce the cavity of the bow piece. 396 501

The neck, or portion lying between the breakwater and the figurehead, was two to three times the length of the deck. Its upper surface was flat, and was the same width as the deck immediately in front of the breakwater, tapering gradually toward the forward end. Its lower surface was hollowed for about one-half its length, the outer end of the excavation being cut to leave a semicircular projection like that already mentioned in the description of the ends of canoe underbodies. Beyond the end of the excavation a heavy flange projected downward, its lower edge being flush with the bottom of the end of the underbody when the bow piece was in position. On the outer side this flange curved up smoothly to the base of the figurehead. The lower edges of the sides of the excavated portion fitted accurately to those of the underbody, and were pierced with lashing poles. Above the edge, however, the sides sloped inward, the flat upper surface of the neck projecting beyond them on either side in a longitudinal flange.

The angle which the neck formed with the body of the canoe seems to have varied considerably. In the specimen photographed the neck is practically parallel to the upper edge of the underbody, and the early accounts and pictures would seem to indicate that this was usual. According to informants, however, it curved upward sharply beyond the end of the underbody, and all the recent canoe models show this feature in more or less exaggerated form. In the double canoe shown by Christian (10, p. 180), the neck of the bow piece of one canoe is of the form already described and curves upward at only a slight angle, while the neck of the other canoe curves up much more abruptly. In the second specimen the upper surface of the neck does not project over the sides, but curves down into them smoothly, as in the normal stern pieces.

The form of the figurehead and its relation to the neck can best be described by comparing it to a long handled shovel laid back up, the neck corresponding to the handle and the figurehead to the blade. The base of the figurehead projected out sharply from the neck on either side, while the forward end was semicircular or was bluntly pointed. The upper surface was convex, the point of greatest thickness being at the middle of the rear end. It was carved into a single, large, flat face, chin forward. The convention was the usual one except that the broad mouth was crescent shaped, and the ears were represented by thin semicircular flanges which projected from either side of the head just beyond its juncture with the neck. [532]

THE STERN PIECE

Two forms of stern piece were employed in the Marquesan built up canoe. The one shown in the accompanying picture (Pl. XLII, *E*) is apparently the commoner type. For the sake of convenience in description this form may be divided into three parts—the body, deck and tail.

The body of the stern piece was that part which rested upon the underbody of the canoe. It formed a third to a half of the total length of the stern piece, supporting the deck and tapering off into the tail at the rear. The lower surface of the body was deeply hollowed, while the outer sides curved inward gradually meeting in a distinct ridge along the median line of the upper surface. The lower edges were cut to conform accurately to the upper edges of the stern of the underbody, and were pierced with holes for lashings. The rear end of the body terminated in a heavy, downward projecting flange which rested against the stern of the underbody and was identical in form and arrangement with the corresponding flange on the bow piece.

The deck, although hewn in a single piece with the body, had the appearance of simply resting upon it, its sides and rear edge projecting beyond the sides of the body. Its upper

396 501 surface was flat and almost rectangular, curving up into a transverse flange at the rear. At the forward edge of the body there was a narrow vertical flange, extending from its lower edge to the deck, which served to make a close joint between the stern piece and the side planks. The edges of the deck were pierced with two vertical lashing holes which served for the attachment of the ends of the side planks. The inner end of the stern piece was sometimes considerably thicker than that of the bow piece, raising the level of the stern deck. When such was the case the height of the transverse flange at the rear end of the deck, really a stern breakwater, was less than that of the bow breakwater. The upper edges of the two breakwaters were always at the same level.

In the two oldest canoe models studied, a long oval projection with an almost circular depression in its upper surface extended from the center of the stern breakwater over the body. The only genuine stern piece seen did not show this feature and it is not found in the more recent canoe models. The purpose of the projection was not learned.

The stern piece narrowed rapidly to form the tail, a long flat projection, like a thick plank with the edge up, which rose from the body of the stern piece at an angle of twenty to thirty degrees. It might be either straight or slightly curved, and was pierced near the outer end and along its length with two or more holes, or slots, which served for the attachment of various ornaments.

The stern piece of one of the large canoes in Hakaui referred to (p. 303), is said to have been eighteen feet long and of the type just described.

In the second form of stern piece (Pl. XLII, *C*) the deck and body parts were of the same form, but the rear end fitted down closely upon the stern of the underbody, without overlapping or projecting beyond it. Informants insisted that all canoes had the high tail piece, but were uncertain how it was attached to this form of stern. Fleurieu (23, pp. 131 to 132) says: "The stern is made of two planks four inches high, placed on edge and rising in the form of an elongated and flattened S." Stewart, an unusually trustworthy observer says: "From the keel on each side a light round timber extended, curving gradually upward like the runners in the front of a sleigh, and terminating in a broad flattened blade, six to eight feet above the water." (59, p. 244.) It seems probable, therefore, that in stern pieces of the sort just described the tail was made in two pieces which were lashed one on either side of the canoe.

SIDE PLANKS

The side plank of a Marquesan built up canoe was a flat piece of wood of the same thickness as the rim of the underbody and a foot to a foot and a half in width (Pl. XLII, *G*).

The upper edge was hewn into a narrow gunwale, the inside of which was flush with the surface of the plank, while the outside projected as a narrow flange. The lower half to two-thirds of the plank was cut away at either end in a long curve, so that while the length of the upper edge was equal to the distance between the outer surfaces of the breakwaters when the bow and stern pieces were in position, the length of the lower edge was only slightly greater than the distance between the inner ends of the bow and stern pieces. At the points of contact of the side planks with the end pieces, the inner surface of the planks was cut away to insure a tight joint, the cutting being deepest at the lower edge and becoming gradually shallower toward the top. As a result of this, the upper part of the side plank was forced out somewhat when it was in position so that the whole plank formed a slight angle with the sides of the underbody.

A series of triangular lashing holes, corresponding to those of the underbody in size and position but with the base down, were pierced through the side planks a short distance above its lower edge. Additional holes for the outrigger lashings were made through the upper edge immediately below the gunwale. There were usually three of these, the two outer holes being placed a short distance within the points of contact of the side plank with the bow and

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stern pieces, while the third was midway between them. Other lashing holes were pierced through the lower edges of the projecting ends of the side plank and served to attach it to the bow and stern pieces, while still others were made under the gunwale at either end to serve for the attachment of bow and stern platforms. Where a supplementary breakwater was used, holes for its attachment were pierced through the forward ends of the side planks near their outer edges.

The Strips

Four strips were used to cover the seams between the underbody and the side planks, bow and stern pieces.

The strips were of unequal length, the two outside strips extending the full length of the underbody while the inside strips only covered the space between the inner ends of the bow and stern pieces. The upper edges of the inside strips were cut away for a short distance at either end so as to form a close joint with the lower corners of the bow and stern pieces. The strips were made either of soft wood or bamboo and were an inch to an inch and a half in width. When bamboo was used a stalk was split lengthwise and the divisions at the joints cut out. The wooden strips were rounded on the outside and hollowed longitudinally on the inner surface. On long canoes the strips were made in several sections, but there seems to have been no definite order in the arrangement of these. Although the edges of the strips were cut to fit the sides of the canoe as accurately as possible, their purpose appears to have been to protect the pad used between the underbody and the upper sections rather than to make the seam watertight.

Other Canoe Parts

Other elements were sometimes incorporated into the built up canoes.

A supplementary breakwater was in common use (Pl. xlii, *F*), consisting of a thin plank, in the form of a broad flat crescent with stubby points, which was sometimes attached to the upper edge of the bow breakwater. The lower edge of this plank rested upon the top of the breakwater and was accurately fitted to it, while the sides projected beyond the sides of the bow piece. It was attached by lashings to the center of the breakwater and at the ends of the side planks.

A second feature, of greater ethnological interest, was the use of bulkheads. No information was obtained from the natives in regard to bulkheads, but they are shown in certain canoe models and are mentioned by Porter in his description of the Ua Huka canoes. He says: "Three pieces of thin plank, placed in the manner of partitions, divide the interior into four parts and perform the office of timbers to keep the vessel from separating or closing." (49, p. 79.) Judging from the models, these planks were cut to fit accurately the interior of the canoe, being notched on either side to accommodate the strip covering the side seam. The tops were flush with gunwales to which, in one model, they were fastened by single lashings near the top on either side.

It is probable that thwarts designed simply to strengthen the canoe were not used, but the war canoes had seats for paddlers. According to informants the seats were flat planks resting upon the top of the inside strips. Large canoes might have as many as ten seats.

ASSEMBLING THE CANOE

In some of the larger valleys the canoes were kept in special houses on the beach, and were probably left assembled at all times. According to informants in other places, canoes were usually taken to pieces as soon as they were beached and the parts carried up into the valley. A highly probable explanation of this

396 501 practise, which involved much unnecessary labor, is given by Porter (49, pp. 101-102). He says:

> [422] Each piece, and indeed each paddle has its separate proprietor. To one belongs the piece projecting from the stern, to another the part forming the bow. The pieces forming the sides belong to different persons and when a canoe is taken to pieces, the whole is scattered throughout the valley and divided, perhaps, among twenty families. Each has the right of disposing of the part belonging to him, and when it is to be set up each brings his piece with materials for securing it. The setting up of a war canoe goes on with the same order and regularity as all their other operations.

Mention of this curious system of ownership is also made by Desgraz (15, pp. 281-282) but as his book appears to be a little more than a compilation from earlier sources, this can hardly be taken as a verification.

It seems certain that there must have been a definite order in which the various sections were placed in position, but no exact information was obtained on this point. The structure of the canoes, however, partially indicates the following sequence:

The first step must have been to arrange the pads which took the place of caulking between structures or sections. There were four of these, two being placed along the sides of the underbody and one at either end. The side pads consisted of two thick flat ropes, of the same length as the underbody, each of which was plaited from three strands of coconut husk fiber. Cellular tissue of the husk was left adhering to this fiber, probably with the idea of filling the interstices and making the finished seam more nearly water tight. These ropes were laid along either edge of the underbody, being held in position by continuous bark strings which fastened them to the underbody at each lashing hole. The end pads were made from a number of the fiberous leaf sheaths of the coconut which were spread out flat with their upper ends resting on the top of the underbody and their lower ends bending down over its flat vertical bow and stern. They do not seem to have been attached to the underbody in any way.

The next step was to place the bow and stern pieces in position, and then the side planks. Whether the bow and stern pieces were attached before the side planks were put on is uncertain, but it seems probable that the whole superstructure was lashed to the underbody in a single continuous operation. In the models the lashing of each side is done with a single continuous line, beginning at the bow.

[284] The lashings were of broad three-plait coconut fiber cord considerably heavier than that used for house lashings. This was passed several times through the upper and lower lashing holes, outside of the strips, the outer side of the lashing being flat, the full width of the hole, and only one cord thick. According to one informant a large wooden needle, with the point barbed on one side was used to facilitate passing the cord in and out. (See section on Miscellaneous Tools.) The upper ends of the side planks were attached to the bow and stern pieces by small lashings, each of a single piece of cord tied on the inside. The inside lashings are said to have been ornamented on some canoes with designs derived from string figures.

CAULKING

501 396 314 [237] The lashings of the underbody and superstructure did not completely fill the triangular holes provided for them, and the openings were caulked with pieces of coconut husk wadded up and beaten in with a wooden mallet and pointed stick. (See section on Miscellaneous Tools.) The seams at the ends of the canoe were calked with feathers, beaten in.

with feathers, beaten in. Langsdorff (38, p. 173) says that the seams were covered with the gum of the breadfruit tree, but this was not mentioned by informants or by any other early visitor. All accounts agree that the craft leaked so badly that one or two men were kept constantly employed bailing.

THE OUTRIGGER

All canoes, when not fastened together in pairs, were provided with outriggers. Quiros (50, p. 28) says that they had "outriggers of cane on either side, after the manner of the gunwales of galleys." Porter (49, p. 102) also mentions the use of double outriggers in connection with large canoes differing somewhat from the type now under discussion. Canoes appear, however, to have been normally fitted with a single outrigger on the right side.

This outrigger was of indirect type, consisting of crosspieces, uprights and a float. In the smaller craft two crosspieces only were used, in the larger canoes there were three, the third being in the middle. These crosspieces passed over the canoe, their right ends projecting beyond it, and were lashed firmly to the side planks by cords passed through holes in the upper edges of the side planks.

Each of the uprights consisted of four or six small sticks or splints. When four sticks were used they were placed two on either side of the crosspiece, and the lower ends of each pair rested together, the upper ends being some inches apart so that they formed a V. Each of these V's in turn sloped outward from the crosspieces; their attachments to the float were a foot or more apart. Informants say that this form of upright, although much more difficult to make than the modern one, was superior to it. In landing through a heavy surf the forward end of the float often strikes bottom, and with the modern heavy upright the canoe is turned end over end. When the old upright was used the thin sticks of which it was composed broke easily, and the canoe would land without capsizing. The lower ends of the uprights were wedged into slots in the upper surface of the float, which consisted of a hibiscus log sharpened at the forward end.

CANOE PLATFORMS

According to old accounts the large war canoes were provided with platforms at bow and stern, while Porter (49, p. 101) mentions an additional central platform on which the chief sat. The use of such platforms is only vaguely remembered by the natives and these platforms are not shown in the newer models. Stewart (59, p. 244) says that the platform was made of small sticks and covered with a mat, and that the stern platform was considerably higher than the one in the bow. In two old models the stern platforms are made as follows:

Two rather large peeled sticks were laid across the canoe, the inner stick being close behind the forward end of the stern piece while the outer was just in front of the breakwater. Two other poles were then laid across the ends of these, lengthwise of the canoe, and the whole lashed to the side planks with bark rope passed through holes in the canoe. The rear ends of the second pair of poles projected slightly beyond the stern breakwater. Two more cross poles were laid on the ends of these, above which two very long poles were placed lengthwise, their tips projecting back almost to the tip of the upward curving tail. The four upper poles were then lashed to the frame formed by the four lower ones. The bow platform was built on the same principle except that the tops of the second set of poles were flush with

396 those of the supplementary breakwater, and two long poles like those of the stern platform
501 were lashed to these, one on each side. The tips of these poles projected forward almost to the
figure head. In rear platforms the top of the cribwork was probably floored in some way. The platform was quite small, and according to the early accounts, was occupied by only one man.

DECORATION OF CANOES

501 Canoe decorations fall at once into two classes—carvings and decorations
incorporated into the canoe and temporary decorations. The use of ornamental
531 lashings has been mentioned, but no details are available.

All informants agree that the bow and stern pieces, and less commonly the side planks, of large canoes were carved. The figurehead, at the forward end of the bow piece, consisted of single large flat tiki face but the designs used on the other parts of the canoe are said to have been either angular-geometric, like those used on house posts, or curvilinear like those used in tattooing. The bow and stern pieces of most canoe models are decorated with angular-geometric designs and these appear to have been more commonly employed on the actual
501 canoes. There was a tendency also to decorate the neck of the bow piece with
532 figures carved in high relief or by the attachment of separate pieces. One old
canoe model (Pl. XLIII, *A*) has, down the center of the bow, two recumbent figures placed face up, with their feet together and their heads touching the front of the breakwater and the back of the figure head. They are carved in one piece with the bow, but are in almost full round, the only points of attachment being the tops of their heads and their buttocks. The bow piece of a second old model has down the center of the top a flat longitudinal ridge to which is lashed a thin vertical plank pierced with two large holes. The rear edge and bottom of this plank form a right angle and the forward edge is curved. In the picture of a Marquesan canoe given by Cook (14, p. 307) the bow has along its center three projections, evidently thin planks two or three feet long, which are recurved at the upper end, like pruning hooks, and have on the back two points. In front of these points large triangular holes are pierced through the plank. Porter (49, p. 79) says that some canoes of Ua Huka had on the bow a small board supported by a rudely carved figure of a man. The more recent models show no trace of these neck decorations. They seem to have been replaced by temporary decorations at an early time.

A small tiki figure was attached to the tip of some of the stern pieces. Stewart (59, p. 244) says that between the two sticks forming the tail of the canoe "a rude image of a god was suspended in a reclining posture." This is verified by a canoe model which has attached to the tip of the stern piece two broad wooden blades which project backward, diverging slightly. Between these blades there is a small tiki figure, facing the canoe in a nearly horizontal position. In Pua Ma'u a small full figure tiki was carved on the top of the tail piece.

The longitudinal strips covering the outside seams of the canoe were 501
painted black and ornamented at each lashing by tufts of white feathers of the 531
tevake bird. The feathers were placed on the stern side of each lashing, and were [237]
held in place by the two or three rearmost loops, their inner ends resting directly
upon the strip.

The temporary decorations in most general use consisted of coconut fronds 501
which were placed along the sides of the bow and stern platforms with their lower
edges trailing in the water. According to one informant they were also placed 531
along the sides of the canoe, but no mention of this is made by early writers. 824
Stewart (59, p. 244) says that in the large canoe seen by him "between the figure head and the bow, three green coconut leaves, four or five feet high, were fastened erectly." Porter (49, p. 102) says: "The seat of the coxswain is highly ornamented with palm leaves and white cloth."

Porter (op. cit.) says that the bow was ornamented with pearl shells strung [237]
on coconut branches.

Two cords were run from the rear corners of the stern platform to the tip 501
of the stern piece, these cords being decorated with tufts of human hair and *pava-* 531
hina (ornaments made from white beards). These cords are still present in one [824]
of the old models, attached to the ends of long poles projecting from the stern
platform. It seems probable that long tapa streamers were also attached to the stern piece, as several of the models are decorated in this way.

Stewart (59, p. 327) says: "A skull was lashed on each corner of the platform elevated at the stern." According to an old informant, the bodies of any [727]
enemies killed during a raid were laid across the neck of the bow piece during
the homeward voyage.

HANDLING OF THE CANOES

According to informants the large war canoes were never sailed, but small 502
canoes and double canoes, made from two craft of this type lashed together, were sometimes sailed. The paddlers sat two on a seat and paddled rhythmically, usually chanting in time to the strokes. The steersman sat on the raised stern platform, using a long paddle of ordinary Marquesan form. According to one informant there were two steersmen, one on either side. Porter (49, p. 102) says of these craft: "They are not so fleet as might be expected, as our whale boats could beat them with great ease," and all the early accounts agree that they were rather poorly handled.

SPECIAL TYPES OF CANOES

Mention has been made of double canoes, but according to all the informa- 501
tion obtained by the author these were simply canoes of the built up type which

501 were temporarily fastened in pairs. They were fastened together by heavy poles, corresponding in position to the crosspieces of the outrigger. The space between the canoes was covered with a temporary platform. In some stories mention is made of a railing around this platform. (Handy, personal correspondence.) Double canoes of this sort were used for inter-island trips and for long fishing trips, when the crew expected to be away for several days. Double canoes, made from [724] fishing canoes, are said to have accompanied the war canoes on long raids to carry supplies.

Porter (49, pp. 102-103) mentions still another type of craft which is so remarkable that it seems best to give the quotation in full. He says:

> Their fishing canoes are vessels of a larger and fuller construction, many of them being six feet in width and of an equal depth. They are managed with paddles more resembling an oar, and are, in some measure, used as such, but in a perpendicular position, the fulcrum resting on the outriggers projecting from each side. With these they proceed to the small bays on the coast, where they fish with the scoop net and with the hook and line. . . . The canoes used for the purpose of navigating from one island to another, a navigation very common, are similar in their construction to the larger kind of fishing canoes, and are secured two together by beams lashed across. These are called double canoes and are furnished with a triangular sail made of mat. . . . These are also worked during a calm with paddles and appear capable of resisting the sea for a long time. The canoes formed for the sole purpose of going in search of new lands are of a still larger construction, and are rigged in the same manner.

No other author mentions craft of this large type but the quotation just given is preceded by a detailed and accurate account of the built up canoes and, except for a tendency to exaggerate dimensions, Porter's accounts of material culture seem to be thoroughly trustworthy. It seems certain that at the time of his visit the Marquesans had some vessel of much larger size than the built up canoe and differing from it in construction.

Informants made no mention of craft of this sort, and the type probably became extinct at an early time. Even at the time of Porter's visit the natives had had considerable contact with Europeans, and there were white sailors settled among them. They are, as a race, quick to see the advantages of mechanical improvements, and the rapid adoption of the present type of outrigger shows the speed with which a new idea may spread among them. They had undoubtedly seen many ships' boats, and it is quite possible that they had already developed a hybrid form intended to embody the advantages of both ships' boat and canoe. We have seen that in 1838, twenty-five years after Porter's visit, whale boats had supplanted most of the large canoes, so that the life of the new type would have been short.

On the other hand, Porter specifically says that the large double canoes were of this type, a strong evidence that it was pre-European. Moreover, his

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brief description of the manner of propulsion applies perfectly to the Tongan method of sculling large craft. It would be practically impossible to build a boat six feet wide and of the same depth on the lines of the built up canoes already described, and it seems certain that these boats were made either of planks or of many pieces. Plank canoes were used in the Society and Tuamoto groups and the Marquesans could hardly have been ignorant of this form of boat.

[824]

In a legend of the migration of one of the tribes of Hiva Oa, which was driven out by its neighbors and went to seek new land, it is stated that they departed on large bamboo rafts. The tribe in question lived on the plateau and were said to have used these craft because they had no wood suitable for canoes. No details as to the construction could be obtained.

Porter (49, p. 103) says:

> "[The natives] use also occasionally a kind of catamaran, which they construct in a few minutes, and a kind of surf board. . . . These, however, scarcely deserve to be enumerated among their vessels, as they are used chiefly by the boys and girls, and are intended solely for paddling about the harbor."

SAILS

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[824]

The aboriginal type of sail became obsolete at an early date and it is doubtful whether any of the living natives have seen a genuine ancient sail. Informants insisted that they were like those in use at the present time except that the boom sloped upward instead of being horizontal and that the sail itself was made of coconut mats instead of canvas (pandanus mats were tapu for sails). This agrees perfectly with the brief mention of Porter and the picture given by Cook. Porter (49, pp. 102-103) says:

> Double canoes ". . . are furnished with a triangular sail made of mat, similar to that called a shoulder-of-mutton sail but placed in an inverted position, the hypothenuse forming the foot of the sail, to which is secured a boom.

The drawing published by Cook (14, p. 307) shows a single canoe provided with a mast of rough timber and a triangular sail of matting along the lower edge of which there is a boom also of rough timber. The boom is set at an angle of about forty-five degrees, the apex of the triangular sail being at the juncture of the boom and mast. The upper edge of the sail is concave, and the tips of the mast and boom project for some distance beyond the fabric of the sail. The mast is stayed by a rope running from a little below the masthead to the center of the bow projection, and by three other ropes two of which run to the stern outrigger crosspiece a short distance outside the gunwales of the canoe, while the third is attached to the crosspiece near its outer tip. In the picture the sail is directly over the canoe, between the two inner stays, a system impossible in practice. It seems probable that the author placed it in this position in order to better show

501 285 the arrangement of the stays. A slack line is shown running from the outer end of the boom to the stern seat to control the sheet. In the drawing the lower end of the boom is concealed, but it seems probable that, as in the modern sail, it was not attached to the mast. In the background of the picture there are two small distant canoes one of which is shown under way with the sheet paid out. The side stays are fastened to the bow instead of to the stern outrigger crosspiece, while the bow stay is replaced by a single stern stay. The second canoe is shown with the sail furled, apparently by bringing the boom up against the mast. The method of stepping the masts of the ancient canoes was not ascertained. According to information obtained by Handy, a square rail was used, with a spar at the top and bottom.

PADDLES

501 Porter's mention of "paddles more resembling an oar" (49, p. 152) would imply that more than one type of paddle was in use in the Marquesas, but all the specimens seen or described by informants belong to a single well defined type.

[824] The paddles were made of rose wood, and were often decorated with carving. The manufacture of small highly ornamented paddles of somewhat degenerate form intended for sale as curios has continued until the present time, but the natives have lost the skill necessary for the manufacture of the large genuine specimens; the only ones seen in actual use were old.

The peculiar shape of Marquesan paddles makes them easily recognizable in any collection. (See Pl. XLIII, *B*.) In length they range from 4 feet, 8 inches to 5 feet, 8 inches, although the steering paddles used on war canoes were probably still longer. The average length is slightly over 5 feet. For convenience in description they may be divided into three parts, the shaft, the blade, and the terminal knob, a projection below the blade.

The shaft is approximately circular in cross section and tapers very slightly toward the upper and lower ends. In some old specimens the central part is somewhat flattened laterally, but this may be due to long use. The upper end terminates in a cylindrical knob, slightly thicker than the shaft, or in a flat expanded transverse grip with a concave upper surface. Only one specimen of this sort was seen, the grip in this having been originally two inches in width. At the lower end the shaft passes imperceptibly into the blade.

The total length of the blade, exclusive of the terminal knob, is one foot to 15 inches, with a maximum width of 6 to 7 inches. The wings of the blade curve outward gradually from the shaft to the point of maximum width, which in a blade one foot long is slightly less than 11 inches from the upper end. From this point they curve inward sharply toward the base of the terminal knob. The thickness of the wings at the edges is about ¼ inch, this thickness remaining uniform for the entire length of the blade. The center of the blade has a thickness of ¼ to ½ inch, gradually increasing toward the ends. The outer surface of the blade is convex, either smoothly rounded or with a slight longitudinal ridge along the center. The inner surface is concave, the center, at the point of greatest depth, being sometimes as much as ½ inch below the level of the wing edges.

The form of the terminal knob may be seen from Plate XLIII, *B*. The knob is connected with the blade by a short neck which curves upward and backward. The inner side of this neck bears a rather sharp longitudinal ridge which continues for a short distance up the blade. The outer surface is flat or bears a much lower longitudinal ridge which continues for a short

501 distance up the blade. The two surfaces meet in a rounded edge into which the wings of the blade blend gradually. The knob proper is set at an angle with the neck, causing it to project slightly backward from the line of the blade. It is sharpened anteriorly and posteriorly except at the rear end of the outer surface, where it is sometimes flat. The knob thickens gradually from the neck to a point about two-thirds of its length from the base, then thins gradually to the tip, which is finished with a blunt edge.

This knob is the most characteristic feature of Marquesan paddles and its uniformity in shape and proportion in different specimens seems to indicate that it served some definite purpose. A number of explanations were given by the natives, the usual one being that it caused the paddle to make a pleasant sound when pushed through the water. Other explanations are: That the knob made the paddle a more effective club in sea fights; that it prevented the blade from being splintered when pushing off the rocks; that by means of it the paddle could be rested securely on the forked top of the outrigger; and that it kept the blade from side slipping in the water. The knob does fulfill all these purposes. A somewhat similar knob appears on paddles from Easter Island and Mangareva.

The manufacture of paddles of this sort called for a carefully preconceived design and great skill in execution. The finished instrument justifies the care expended upon it, however, for in balance and effectiveness these curiously shaped paddles are greatly superior to the European forms.

DECORATION OF PADDLES

501 531 In pre-European times paddles were decorated with carving applied to the knob at the upper end of the shaft, the blade, and possibly the terminal knob. Carved paddles are still manufactured in the Marquesas for sale to Europeans, and practically all specimens now in museums belong to this class. No authentic ancient specimen was seen, and it is impossible to tell whether the designs employed in the modern paddles are the same as those used in ancient times.

501 531 824 Two distinct techniques were employed. In paddles made of *mio* wood the designs were simply carved upon the surface. In paddles made of *hutu* wood (*Barringtonia speciosa*) on the other hand, the surface was first charred to blacken it, and the designs were then cut through the blackened wood to the natural white wood underneath, making the finished design show in sharply contrasted black and white. *Hutu* wood was rarely used for real paddles, and it seems doubtful whether this second technique was applied to paddle decoration in ancient times.

[532] The knob at the upper end of the paddle shaft was carved either into two small tiki figures, placed back to back, or into two heads similarly arranged. The convention of representation was the usual one, flat features, spectacle eyes, and broad mouth. In some paddles the space between the figures was pierced.

The paddle blades were elaborately carved on both the upper and lower surfaces, and in one specimen the decoration extended a short distance up the shaft. The area to be decorated was divided transversely into three or more zones which were treated as separate units. The lowest of these zones was semicircular, the outer edge corresponding to the bottom of the paddle blade. There was a strong tendency to make a large semicircular figure the principle feature of

501 531 at least one other zone. In all the specimens seen there was a complete absence of simple angular-geometric designs of the house post type. The designs used were selected about equally from those regularly used for tattooing and bowl carving. Tiki faces and even flattened figures were noticed in a few paddles. Edge-Partington (20, p. 5) shows a paddle having a design carved on the inner side of the blade and two heads in high relief on the outer side.

It would appear that paddle designs did not constitute a distinct class. All the specimens studied are more or less recent, however, and it is quite possible that there were originally distinctive paddle designs which have been gradually overlaid or lost. In many of the commercial specimens the terminal knob is decorated with very simple angular-geometric figures like those carved on house posts, but it is impossible to say whether the practice is ancient.

BAILERS

501 [824] The constant leaking of a built up canoe made the bailer a necessary part of its equipment, and bailers of the ancient form are still in constant use throughout the group. These bailers are made of *mio* or temanu wood, and are shaped like a sugar scoop with the handle reversed, that is, projecting forward over the cavity. The top of the bailer is perfectly flat, the upper side of the handle being flush with the edges of the scoop. The bottom is also flat, rounding up gradually in the rear. The forward edge of the scoop is straight, the upper corners being rounded off. In ancient times some bailers were carved, but no decorated examples were seen. (See Pl. XLIII, *D* and *E*.)

CANOE MODELS

[435] Numerous references have been made in the course of this paper to canoe models. At the present time many of these models are made for sale to Europeans. The industry centers in Fatu Hiva. It is certain that models were also made in early times, and there is mention of their use in connection with religious ceremonies. The modern models are elaborately carved all over; the designs used are borrowed from tattooing and bowl carving. (See Pl. XLIV, *B*.) The designs used upon the superstructure are usually simple angular-geometric motifs of the sort said to have been used upon the actual canoes, although in the recent specimens there is a tendency to apply curvilinear designs to these parts also, especially [824] to the side planks. Many of the recent examples are made of *hutu* wood, treated by the method mentioned in connection with the paddles.

The desire for quantity production has led in the newer models to a lack of accuracy in the proportions of the various parts and the omission of all details not visible when the canoe is assembled. They can therefore serve as a guide only to the general form of the ancient craft. The really old models on the other hand are decorated only on those parts which were decorated 501 in the actual ancient canoe and show a close attention to all details, even those hidden when the canoe was assembled, which is good evidence that the maker attempted a replica of the actual craft. At the present time the natives make models of the European vessels which visit the group and these models are properly proportioned and surprisingly accurate as to detail, the original of any model being at once recognizable. It seems probable, therefore, that the old models reproduce the real canoes with similar exactness, and it seems justifiable to use them for illustration and for the settlement of doubtful points.

Probably the earliest model now preserved is that in the Peabody Museum of Salem, Mass., which was made before 1820. (See Pl. XLIV, *A*.) As may be seen from the photograph it differs somewhat from the descriptions obtained. There are no separate bow and stern piece, the figurehead rests directly on the top of the cutwater, and the outrigger is unusual in form with a direct attachment. It is possible that it reproduces a special type, now forgotten, but it is equally possible that its extremely small size has led to the omission of certain features. Next in age to this model are two preserved in the Bishop Museum (Pl. XLIV, *C*) which agree in every way with the descriptions given, and appear to be accurate replicas of the ancient craft. The highly decorated example (Pl. XLIV, *B*) is comparatively new, and was probably made for sale to Europeans.

COMPARISON OF POLYNESIAN CANOES

The simple dugout is of such widespread use among primitive peoples that 501 a consideration of its occurrance is of little or no comparative value. Quite the 171 reverse is true, however, of the built up canoe, as such craft offer a wide field for possible variation. If we study the Polynesian canoes of this sort we find that in Tonga and Samoa, and from there eastward to the Society Islands, these craft were built up of many sections, each cut to fit its position in the whole. These sections were fastened together by cords passed not through the body of the plank, but through oblique holes cut in flanges or projections left on the inner side of each section at the time it was hewn. No lashings were visible on the outer surface, which, after the boat was assembled, was rubbed down to an even finish. The sections were so accurately fitted that it was often difficult to detect the joints. In Hawaii, the Marquesas, and New Zealand, the built up canoe consisted of five parts, an underbody—hewn when possible from a single log—bow and stern pieces, and side planks. These were attached by lashings passed through holes in the body of the plank so that they were exposed on the outside. The Samoan and Tongan craft had a sharp cutwater and were flat at bow and stern. Certain parts of the larger Samoan canoes were carved but the bow and stern decorations were limited to knobs carved on the flat upper surface or on the

50/ 171 edges of the gunwales. Only one Samoan form, said to be a result of foreign influence, had an upward curved projection at bow and stern. In the Hawaiian canoes we find no distinct cutwater as the bottom curves upward and narrows to a point. The bow is unornamented but has a short projection. In the Marquesas and New Zealand the bow and stern of the underbody are of the form just described for Hawaii. The bow piece extends for some distance beyond the end of the underbody while the stern piece curves upward to form a high tail. In the Society Islands the canoes were built of many pieces. The entire hull curved upward at the stern rising almost vertically for some distance, and was crowned with carved figures. At the bow there was a second projection which on some was decorated.

The sails used in Hawaii, the Marquesas, and New Zealand were made in the form of a triangle, with the apex at the foot of the mast and the boom along the lower edge. In Tonga and Samoa, on the other hand, the sail was supported by a yard, or yards, hung from the masthead. The Society Islands sail was fundamentally of the first mentioned type, but differed in having the upper end of the boom recurved.

Bailers appear to have been much the same everywhere in Polynesia, but were decorated with carving only in New Zealand and the Marquesas. Marquesan paddles appear to have no exact oceanic parallels, but resemble somewhat those from Easter Island and Mangareva. It is interesting to note in this connection that many of the Hawaiian paddles have on either side, near the tip of the blade, a short rib which serves no practical purpose. It seems possible that this is a survival of an earlier knob or end projection.

It is apparent that in the canoes, as in the houses, there are clear indications of an eastern and a western type. The eastern type is characterized by the use of only five essential parts, bound together by lashings which are visible externally, and by the use of a triangular sail and boom. The western is characterized by the use of many parts bound together by lashings, invisible externally, and by the use of a sail with a movable yard hung from the masthead. The use of ornate bow and stern pieces is unknown in the western area, with a single possible exception, but is normal in the eastern area except Hawaii.

If we compare the Maori and Marquesan canoes we find a series of resemblances so striking that they argue a close cultural relationship. Both boats are basicly the same in the form and arrangement of the parts, and in both the bow piece terminates in a figurehead. In the smaller Maori canoes this figurehead is a simple face borne on the end of a constricted neck, as in the Marquesan form. In the more elaborate Maori forms the figurehead is carved into a full figure, but the high vertical ornament of the Maori bow pieces finds a parallel in the pierced planks placed along the center of the Marquesan bow piece. In both we have the high ornamental stern projection. In both, the upper edges of the side planks were expanded to form flat gunwales and the planks themselves were often decorated with carving. In both the Maori and Marquesan canoes, the strips covering the outside of the seams between underbody and side plank were blackened and were decorated with tufts of white feathers at the lashings. Among the Maori, the feathers for this seam decoration were obtained from the shearwater, and although the species of bird from which the Marquesans obtained their feathers for this purpose was not identified, the native descriptions of the habits of the birds makes it almost certain that these people also obtained their decorations from the shearwater.

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The resemblances just noted are too close and numerous to be the result of independent evolution, and although the canoes of the two groups differed in certain minor structural details, the conclusion is inevitable that they represent divergent developments of a single type. The existence of such closely related forms at almost opposite ends of the Polynesian crescent, when the space between is occupied by forms which differ from both more widely than the Maori and Marquesan canoes differ from each other, is best explained by the assumption that they represent marginal survivals of a form which had been diffused over the whole eastern area, but which has been destroyed or overlaid in the intervening regions. The Society Island canoes, with their combination of high stern and prow with many piece construction, are probably a hybrid type resulting from the superposition of the western style of construction upon the Maori-Marquesan form. The exact relation of the Hawaiian canoe to this Maori-Marquesan form is difficult to establish. Basicly they are the same, but the Hawiian canoe lacks all the ornamental features of the other type. It seems probable that both are descended from a common ancestor while the relatively greater simplicity of the Hawaiian canoe suggests that it stands nearer to this original form. The features which distinguish the Maori-Marquesan type—the high bow and stern and profuse decoration—are strongly suggestive of Melanesia, and it seems probable that they are a result of Melanesian influence.

STONE ARTIFACTS

412 324 [325] [321] [135]

The original settlers of the Marquesas must have been in possession of effective wood working tools, as they would otherwise have been unable to make the large seagoing craft necessary for so long a voyage. There is nothing to indicate that they were familiar with metals, and these tools must therefore have been of stone or shell. In Oceania the use of shell adzes is practically limited to localities in which stone is rare or absent and it seems probable that the first arrivals in the Marquesas brought with them a knowledge of stone working and of at least the simpler implement forms. The islands of the group, with a single unimportant exception, are volcanic, having a great variety of lavas, basalts and tuffas, but they contain no workable deposits of sedimentary or metamorphic rocks. The presence of obsidian is questionable. The primitive implement maker thus had an abundance of material at hand which could be worked by the processes of pecking, grinding and chipping but no minerals which could be pressure flaked. Deposits of workable stone occur in practically all the large valleys, and although there was a distinct tendency toward local specialization and trade, implements of all the known types appear to have been at least occasionally manufactured in each locality. The stone working industry was thus in the hands of many persons, with a corresponding increase in the chances of individual variation. There are a few indications of the existence of local implement types, but the differences are unimportant.

HAMMERSTONES

The hammerstone is the foundation of any stone industry. Marquesan hammerstones were simply hard, water worn pebbles of convenient size and form which were obtained from stream beds or bowlder beaches. They were not shaped and appear never to have been hafted, and can be distinguished from other pebbles only by the battering of the ends. (See Pl. XLVIII, *F.*)

ADZES AND CHISELS

Under this head it has been thought best to describe all stone implements other than gouges, which have a cutting edge transverse to their long axis. No axes have been reported from the Marquesas. Many implements may, from their form, be at once identified as true adzes, but there is a large class of tangless blades whose use can not be established by the form and it seems best to describe them as a group rather than to risk the error of an arbitrary division into adzes and chisels.

Adzes and chisels appear to be uniformly made of phonolite. The material varies more or less, especially in the larger specimens, and it is evident that it was obtained from several sources. No adz quarries were visited, and from the ac-

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counts of informants it appears probable that the stone was obtained from rock slides and bowlders in the river beds. According to information obtained by Handy in Pua Ma'u, Hiva Oa, a boy's first adz was made from a fragment of a special black stone which was kept for that purpose in the *me'ae*. Informants were ignorant of the original source of these stones, and of how they were replaced when used up. No objects which might answer this description were seen in any of the *me'ae* visited.

The only large adz workshops visited were on the island of Ei Ao. During the late prehistoric period this island was a tributary of one of the tribes of Nuku Hiva, and the adzes made there were brought to Nuku Hiva and from there distributed in trade to all the other islands of the group. The area of these workshops, and the quantity of chips and rejects, would indicate a highly developed, long continued industry. No regular quarries were known to natives familiar with the island, but a few bowlders of phonolite suitable for adz making were seen. Small workshops are scattered all over the island, but curiously enough the center of the industry appears to have been on the top of a high ridge running along the southern side of the island, at a considerable distance from any source of material. Two striking features of the workshops of Ei Ao are the preponderance among the rejects of small thin forms, and the lack of ground specimens and grinding stones. This would seem to indicate that the trade called for chisels and carving tools rather than for large adzes and that the blades were exported unground.

The only tools employed in adz manufacture were hammerstones and grinding stones. The grinding stones consisted of smooth surfaced natural rocks of varying grain upon which the adzes were rubbed. Large natural bowlders whose surfaces have been worn into pits and grooves by adz grinding are still visible in the neighborhood of many settlements. The grinding of the gouges must have been done with some sort of small whetstone, but no examples were seen. Chants collected by Handy (personal correspondence) mention the use of sand in either the grinding or finishing of adzes, and it seems probable that the sand was placed in the grooves and hollows already worn in the large grinding rocks to hasten the abrasion.

The processes employed in adz manufacture were chipping and grinding, with a limited use of pecking. This last appears to have been used only in connection with a single specialized adz type, the *toki aa*. It is evident from rejects that the adz makers were especially skillful in chipping, bringing the implement to approximately its final form by this method. The chipping upon the bits of adzes is especially fine, the work approaching in excellence that done elsewhere by the pressure flaking process. The cutting edge of the adz was always ground but the finish on other parts of the implement was extremely variable, used specimens showing all conditions from simple chipping to complete grinding and high polish. According to one of the chants already mentioned the finished adz was honed on the thigh to produce a final polish. The making of a boy's first adz was accompanied by various religious observances which have been described by Handy (32).

The collections of the Bishop Museum contain nearly fifty Marquesan adzes and chisels, and an approximately equal number have been studied elsewhere. From this series it is evident that in the Marquesas these artifacts show a higher degree of variation than in any other part of Polynesia with the possible exception of New Zealand. As a whole they fall at once into two main groups, distinguished by the presence or absence of a tang, while the tanged adzes may be further divided into simple adzes, *toki aa* and *toki kouma*.

SIMPLE TANGED ADZES

The blades of the simple tanged adz are distinguished by a broad straight bit, a cross section varying from rectangular to triangular and sides which slope inward toward the poll. In the quadrangular examples the inner surface may be either flat or slightly concave. The tang is formed by chipping away a portion of the upper end of the outer surface. It can not be distinguished on the inner surface. In some of the triangular specimens the sides of the tang are also chipped away, giving the blade a slight shoulder, but this is not a common feature. As a rule these blades are ground only on the bit and outer surface, exclusive of the tang. In all the quadrangular examples the width of the inner surface is equal to or less than that of the outer surface, never greater. Many of the rectangular specimens of this type agree so closely in form and finish with the normal adzes of the Hawaiian group that in a mixed collection it would be impossible to distinguish them. (See Pl. XLV, *D.*) The triangular adzes of this type, on the other hand, are practically identical with those normal for the Society Islands. (See Pl. XLV, *A-C.*) The bulk of the specimens fall between these two extremes.

TOKI AA

Blades of the *toki aa* type are recognized as a separate class by the natives themselves. They are characterized by a distinct tang, a heavy blade of rectangular cross section, and a more or less complete grinding of all the surfaces. Practically all the specimens of this class are large. The most striking features of the type are the great thickness of the blade portion, which in many adzes exceeds the width of the cutting edge, and the high angle formed by the two faces of the bit, usually fifty degrees or more. The *toki aa* appear to have been the only adzes in whose manufacture the pecking process was employed. In one of the Bishop

Museum specimens, No. B3070, the tang has evidently been shaped by this method, while an unfinished specimen, No. B3074, is pecked at the bit. *Toki aa* are said by the natives to have been used for the final dressing of planks. (See Pl. XLV, *E, F.*)

TOKI KOUMA

The *toki kouma* are also recognized by the natives as a distinct class. They are characterized by a long narrow blade of triangular cross section, a well marked tang whose outer surface is often concave, and a narrow bit. In many examples the whole implement has a slight backward curve, the inner surface, which forms the base of the triangle, is more or less concave. The bit is formed by grinding away the base and a varying proportion of the apex of the triangular blade, and by partially grinding the sides adjacent to it. When seen from the front, the bit has the appearance of a shallow angular U with divergent sides, and the implement makes a cut resembling that of a gouge rather than an adz. In a few specimens the inner side of the bit is more or less hollowed, as in European gouges. (See Pl. XLV, *G, H.*)

Adzes of the *toki kouma* type are relatively common in the Marquesas, forming about 30 percent of all the specimens observed. They are of all sizes and were employed for a variety of purposes from the hollowing of canoes and containers to cutting ornamental designs on canoes and house posts. One specimen, said to have been used for fine carving, is 7 inches long, with a width of about ¼ of an inch at the bit. It seems certain that heavy, narrow-bitted *toki kouma* were also used in quarrying and dressing the large stone slabs employed in many Marquesan structures.

TANGLESS ADZES

The tangless adzes include a great variety of blades. The larger ones are probably true adzes while the smaller may have been either adzes or chisels. In cross section they range from nearly rectangular to triangular and in finish from a high polish on all surfaces to a simple grinding of the bit. In all examples seen the sides converge more or less toward the poll, which in some specimens is rounded or almost pointed. The bevel of the edge is in every case ground from the narrow side of the implement, which rests against the haft. In the larger specimens, the whole implement frequently has a well marked backward curve. (See Pl. XLVI, *A.*)

Adzes of this type are more numerous in the Marquesas than those of any other class. They are variable in size, outline, and cross section and appear to grade imperceptibly into the simple tanged adzes. The tangs of some specimens are so slight that it is difficult to determine in which class they should be placed.

UNCLASSIFIED ADZES

412
324 There are a few Marquesan adzes which defy classification and deserve individual descriptions.

A large adz 8⅞ inches long with a maximum thickness of 1½ inches is shown in Plate XLVI, *B*, 1. The poll is 2½ inches wide and has across its center a well marked ridge. The bit has the remarkable width of 7¼ inches. The blade is rectangular in cross section and has been smoothly ground on all surfaces. The bevel is ground at a long angle, making a thin blade unsuitable for heavy work and it is hard to see for what purpose an implement of this sort could have been employed. The specimen is heavily patinated, indicating a considerable age.

The adz illustrated in Plate XLVI, *B*, 4 has a thin, flat, completely polished blade of beautiful workmanship. It is 3 inches long, with a thickness of less than ⅜ of an inch and a width of about one inch at the top and 1⅜ inches at the bit. The edge is ground with a flat well-marked bevel, and the angles formed by the juncture of the sides with the inner surface have been rounded off.

A large adz of remarkably fine workmanship is shown in Plate XLVI, *B*, 2. In general outline and form of tang it conforms to the *toki kouma* type, but the sides below the tang diverge rather rapidly, forming a broad bit instead of the narrow one normal in implements of that type. The lower side of the bit is considerably hollowed, giving to the cutting edge a well marked curve. The dimensions are: length, 11½ inches; length of tang, 4 inches; maximum thickness of blade, 2¼ inches; width at upper end, 2 inches; width at bit, 3¼ inches. This specimen was purchased in the island of Ua Huka and is said to be of local material and workmanship.

The still more curious adz shown in Plate XLVI, *B*, 3, is the largest Marquesan adz known to the author, being 14½ inches long and weighing slightly over 6 pounds. The upper end is formed into a well marked tang 4½ inches long. Below this tang the shaft is triangular in cross section and of uniform size to within 4¾ inches of the bit. From this point the inner surface slopes forward at an angle of 40 degrees, while the sides broaden out and the outer edge slopes slightly backward. As a result of this the inner ground surface of the bit is oblong, the outer triangular. The whole surface is heavily patinated indicating an age greater than that of most of the specimens in the collection.

On Plate XLVI, 5 is shown a small and crudely made blade 3¼ inches long, one inch wide and one inch thick. The shaft is triangular, but with the base of the triangle forming one side of the implement so that its plane is across that of the cutting edge. The bit appears to be ground equally from both sides, as in an axe, and the cutting edge forms a distinct angle with the axis of the implement, as in

a turner's chisel. The shaft, either from accident or intention, is curved to fit 412
the hand accurately, and the whole surface shows a slight but even polish of the 324
sort acquired through wear, so that it is probable that the implement was never hafted.

COMPARISON OF MARQUESAN ADZES WITH OTHER POLYNESIAN TYPES

A thorough comparative study of Oceanic adzes would, the author believes, 412
yield results of great ethnological value. Such a study is beyond the scope 171
of this paper, but it seems well to point out the features which distinguish Polynesian adzes as a class from those used in Melanesia, and to indicate the distribution of the various Polynesian types. No satisfactory information is available for some parts of Polynesia, but the conditions appear to be as follows:

Melanesian adzes as a class are oval or eliptical in cross section, with smoothly rounded contours, and nearly all of them are completely ground and polished. The use of a distinct tang is unknown. Polynesian adzes, on the other hand, are triangular to rectangular in crosssection with surfaces composed of a few large planes meeting at sharp angles. New Zealand appears to have been the only locality in which the grinding and polishing of all surfaces was normal. Fully ground specimens are fairly common from Tonga, the Society, Austral and Cook groups, and from Easter and Chatham Islands, but are less numerous in collections than those which are at least partially rough. In Hawaii and Samoa fully ground adzes are almost unknown, while in the Marquesas complete grinding is practically limited to the *toki aa* type. In Tonga there appear to be two quite distinct types, one of which is clearly Melanesian while the other is an angular tangless blade of Polynesian character. Adzes of Melanesian contour and finish are present in collections from New Zealand, Easter Island, Chatham Island and rarely from the Society Islands. It thus appears that, broadly speaking, adzes of Melanesian type are present in all those localities in which there is a marked tendency toward complete grinding of recognizably Polynesian forms, while they are lacking in regions where complete grinding is rare or absent. It seems probable, therefore, that this feature is everywhere referable to a Melanesian influence, either direct or transmitted, and that the original Polynesian implement was ground, at most, upon the bit and outer face.

The angular Polynesian adzes may be divided into two main classes, tanged and tangless, each of which contains a number of subtypes. Tanged adzes are present in all the marginal Polynesian areas and extend as far west as the Cook Islands but they are rare in Samoa and absent in Tonga. They are divided into well marked local types: the Hawaiian type, the Southwestern type and the New Zealand type.

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The Hawaiian type is characterized by a rectangular or nearly rectangular cross section, relatively thick blade, and grinding upon the bit, or the bit and outer surface only. Fully 90 per cent of the Hawaiian specimens have this form, but its only occurrence outside that group appears to be in the Marquesas, where it is one of the rarer forms (Pl. XLV, *D*).

The southeastern type is characterized by a triangular or subtriangular cross section, a relatively thin blade with a long bevel, and a more or less distinct shoulder where the blade meets the tang. It is often completely ground, and is normally better finished than the Hawaiian type. This is the dominant form in the Society, Austral and Cook islands, and in Easter Island, and is not uncommon in the Marquesas, although the specimens from that locality are inferior in finish to those from further south. Several examples of this type are known from New Zealand but it is lacking in the Chatham Islands and in Hawaii. (See Pl. XLV, *A-C*.)

The New Zealand type is characterized by a rectangular or nearly rectangular cross section, approaching in this respect the Hawaiian type. It is distinguished from the Hawaiian type by its thinner blade, rounded tang, and by a more or less complete grinding of all surfaces. It does not seem to occur in any other part of Polynesia although certain large adzes from the Chatham Islands may be a variant of this type.

The *toki aa* appears to be about equally common in the Society Islands and the Marquesas with related forms in the Cook and Austral islands and possibly in Easter Island. It is lacking in New Zealand and Hawaii. It is impossible to fix its point of origin, but the complete grinding characteristic of the type is at variance with the ordinary Marquesan practice and it seems probable that it was introduced into that group from the south.

The *toki kouma*, with slight modifications, is found throughout the same range as the *toki aa*. A very few examples come from New Zealand. It is entirely lacking in Hawaii although a few chisels from that locality have a slightly similar blade and bit form. Some examples from southeastern Polynesia and New Zealand are completely ground. The type is numerically important only in the Marquesas, and this, coupled with the fact that all Marquesan *toki kouma* show the rough finish characteristic of the group, may indicate that it was developed there. The occurrence of adzes like that shown in Plate XLVI, *B*, 2, in which a blade and tang of *toki kouma* type are coupled with a broad bit, lend support to this theory.

The *toki kouma* is sharply set off from all other Polynesian adz types by the fact that it was hafted with the base of the cross section triangle against the handle, a reversal of the ordinary practice. Among true adzes the nearest

Oceanic approach to the *toki kouma* form of blade and bit seems to be found in certain shell specimens from Micronesia. 412

Tangless adzes have been reported from every part of Polynesia for which there is satisfactory information. In New Zealand a well marked local type had been developed, with a thin blade of rectangular or nearly rectangular cross section ground on all surfaces. In Tonga also there appears to have been a distinct local type, characterized by a short, broad blade, relatively thin, and completely ground. The bulk of the Tongan specimens, and of the tangless adzes from all other parts of Polynesia, show such uniformity that one is forced to conclude that all were made after an established pattern. This universal type is characterized by quadrangular to subtriangular cross section, sides which converge toward the poll, and grinding upon the bit and outer face only. (See Pl. XLVII, *A*.) 171

The dominance of the two main adz types—that is, tanged and tangless—shows the same distinction between Samoa and Tonga on the one hand and marginal Polynesia on the other, which we have already noted in our study of houses and canoes. The tanged adz is dominant everywhere in marginal Polynesia, and lacking in the Samoa and Tonga. The tangless adzes throughout marginal Polynesia may be explained as a result of western Polynesian influence, but their comparative rarity in the Society Islands where western Polynesian influence is strong, and their frequency in the Marquesas, where such influence appears slight, is an argument against this. The wide distribution of tangless adzes, their relative simplicity and ease of manufacture, and their remarkable uniformity wherever found, suggest that they represent a primitive type originally known to all the Polynesians. Specimens collected in the Marquesas link the tangless adzes with both the rectangular and triangular tanged forms and both probably have been developed from the tangless adz.

The Polynesian distribution of the Marquesan adz types would seem to indicate more or less contact with the Society Islands and Southeastern Polynesia in general, while the remarkable similarity of some of the specimens to normal Hawaiian forms suggests an influence from that group also. The importance of the tangless adz may indicate a western Polynesian influence, but is more easily explained as a primitive survival.

METHODS OF HAFTING

Different methods were employed in the hafting of chisels and adzes. No really ancient specimens of either type were seen but the hafted adzes studied agree with the descriptions of informants and are almost identical with the iron bladed adzes still in ordinary use throughout the group, so they are probably good reproductions of the ancient form. The data in regard to the hafting of 412

412 chisels is much less satisfactory. It is certain that the Marquesans, like the Maori, did employ hafted chisels, but no old specimens are now extant.

Adz Haftings

Only three hafted adzes were seen and one of these was made by the informant who made the chisels. The other two specimens were of considerable age, and all three agreed closely in form. The blades in all three specimens were of *toki kouma* type. The use of other forms of blade may have necessitated slight changes in the form of the haft.

[824] Adz handles were usually made of fau wood, care being taken to select old trees as the young shoots are too soft and brittle for the purpose. In one chant the use of *noni* roots is indicated and in another that of *mio* wood (Handy personal correspondence). A branch and a section of the trunk immediately above it were detached, and the natural hook thus obtained was worked down into a more or less smoothly rounded elbow having the two sides of unequal length. The long arm served as the handle and was made from the branch, the short arm to which the blade was attached, was made from the trunk. The entire haft was thickest at the curve of the elbow, the diameter of the two arms gradually decreasing toward their ends. A socket for the blade was cut in the outer surface of the short arm. The upper end of this socket was at about the level of the inside of the curve at the elbow. The form of this socket naturally varied with that of the blade it was intended to accommodate. In all the specimens seen, the socket was flat, running the entire width of the handle and being cut squarely across, or only slightly rounded at the upper end, but many of the blades collected must have required a socket semicircular or triangular in cross section, and tapering toward the upper end so as to fit the contour of the blade accurately.

412 The tang was wrapped in two or three thicknesses of tapa, which were so
arranged that they intervened everywhere between the stone and the lashings, and
284 socket. The purpose of this wrapping was to increase the friction of the
lashings and keep them from loosening. The lashings themselves were made of
[824] three plait coconut fiber cord of medium weight, and although carefully laid on
were not ornamental in the specimens seen. According to informants ornamental
[531] lashings of red and black sennit were used on at least some special adzes.
(Handy, personal correspondence.)

The arrangement of the lashings in two specimens was very simple, consisting of a single cord beginning at the lower end and passing round the blade and haft. The loose lower end of the cord was carried back up the inner surface of the haft and held in place by the subsequent turns of the lashing. The upper end was thrust down under the two or three uppermost laps on the inner surface of the haft, brought out, and pulled taut. In the third specimen, which was made by the Atu Ona informant, the lashings were laid on in alternate diagonal loops beginning at the bottom. These loops crossed each other along the line of the middle of the tang, giving an ornamental effect. The last two binding loops at the top were horizontal, while two more loops were passed around the haft above the blade. The end was made fast by tucking it under the last few turns of cord on the right side. (See Pl. XLVIII, *A*.) The maker insisted that this form of lashing was the ancient one and it is probable that several forms of ornamental lashing were originally in use. One of these, mentioned in a chant for the making of a boy's first adz, was called the *humua tane oa*, and was probably derived from a string figure of the same name. (Handy, personal correspondence.) 412 284

Adz blades were rarely if ever set at right angles to the handle, the included angle in modern specimens being 70 degrees or less. The handles of ordinary adzes were short, those used at the present time are commonly less than a foot long, but blades used for heavy work, such as roughing out canoes were formerly provided with long hafts. In Nuku Hiva an adz with a four foot handle is said to have been used for this purpose. (Handy, personal correspondence.) 412

The adjustable socket, common in Micronesia and in some parts of Melanesia, seems to have been unknown in the Marquesas, although it was known and used to a limited extent in Hawaii. It is lacking in other parts of Polynesia, and the Hawaiian examples are probably referable to a Micronesian influence.

CHISEL HAFTING

No specimen of the ancient Marquesan chisel hafts was found, and the following description is based on information obtained in the group and upon two reproductions made by Hapuani, of Atu Ona, Hiva Oa. In both these reproductions the handle consists of a straight rectangular stick of wood between 10 inches and 11 inches long, 1 inch wide, and ¾ inch thick. The wood in one is fau, in the other temanu. A socket for the blade is cut on one side of the lower end of the shaft. When in position the blades project beyond the handle for about two-thirds of their length. The lashings are of sennit, arranged as in the more elaborate form of adz lashing, except that the cord is passed around the handle several times above the socket. (See Pl. XLVIII, *B*.) [284]

USE OF ADZES AND CHISELS

No stone adzes have been used in the Marquesas for many years, but as the form of the modern iron-bladed tools is almost identical with that of the ancient ones it seems probable that the method of use was the same. At the present time every skilled workman owns two or more adzes, at least one of which has a

412 curved edge. Each of these adzes has its special use and in doing any piece of work, as the shaping of a bowl, great care seems to be taken to use the proper 412 tool for each stage of manufacture. In working any surface a series of light 322 glancing blows are struck instead of two or three heavy ones. Informants agree that this was also the ancient system. The blade of a stone adz could easily be shattered by a heavy direct blow, and it is related that when a *tuhuna* who had been employed to make some object became dissatisfied with his pay or working conditions he would strike a heavy blow, breaking his adz, and with this as an excuse, refuse to finish.

The small straight bladed adzes are also used as planes. The handle is grasped at the curve, with the blade below the hand, edge forward, and the tool is pushed along the surface of the wood, removing a thin shaving. Stone adzes are said to have been used in the same manner.

Very little data could be obtained on the method of using the hafted chisels other than that they were used to hollow drums and cut the lashing holes [824] in canoe parts. They were struck upon the upper end of the shaft with a *toa* wood mallet like that used in caulking canoes. (See Pl. LVI, *B*.)

GOUGES

412 The Marquesan collection in the Bishop Museum includes four implements uncommon to the group, and it has been thought best to describe them separately under the head of gouges although it can not be said with certainty that they were not hafted and used as adzes. The implement shown in Plate XLVII, *B*, 2 is 6¾ inches long, 1¾ inches wide at the bit and 1¼ inches wide at the upper end. It is almost semicircular in cross section. The cutting edge is curved, but the lower side of the bit, which is ground with a well marked bevel, is flat. The implement fits the hand well and does not appear to have been hafted.

Only slightly smaller than No. 2 and with a similar bit, gouge No. 3 shown on the same plate is distinguished from it by having parallel sides.

No. 4 on the same plate shows a small specimen whose shaft has been broken. The bit has a width of 11/16 inches and its lower surface is slightly concave. The body of this gouge is almost circular in cross section and well polished throughout, although the marks of the chipping have not been completely obliterated. The bit shows use and sharpening, and the implement was probably a carving tool.

No. 1 on this plate is completely ground and has a narrow upper and broad lower surface, both of which are flat, while the sides are somewhat rounded. The upper surface narrows toward the rear so that the blade is almost triangular at the butt (the point of greatest thickness) and the whole shape is reminiscent of the lower part of a narrow *toki kouma* whose tang has been broken off. The implement appears to be complete however, and shows no signs of hafting. It is possible that this implement marks a transition from *toki kouma* to gouges and that the two classes of implements are related. 412

KNIVES AND SCRAPERS

Marquesan knives were usually made from bamboo or shell, and shells were used as scrapers, but stone knives and scrapers also existed. In the absence of iron tools, stone knives have been used as a makeshift until comparatively recent times. Pere Simeon Delmar, head of the Catholic Mission in Taiohae, Nuku Hiva, has witnessed the manufacture of stone knives. He says that the knives, often six to eight inches in length, were made from flakes of a special variety of phonolite, which were detached from a core by a single sharp blow with a rounded stone held in the hand. The natural fracture gave a fairly sharp edge to the flake and it was used without retouching or hafting. When the edge became dull from use, the implement was thrown away. In M. Delmar's experience these stone knives were used only to open and scale fish. Many phonolite flakes were found in old village sites, but their certain identification as knives is impossible. (See Pl. XLVIII, *G.*) [824] [321]

Two stone artifacts were collected which appear to have been scrapers. One of these, found in an old village site, is a large semicircular spall of some basaltic rock which has evidently been retouched along its lower edge. Its form is not unlike that of some of the shell scrapers used for tapa making. (See Pl. XLVIII, *E*, 1.)

The second specimen was collected on the island of Ei Ao. It is a thin spall of phonolite which has been worked into rectangular form and dressed along the outer end and one side with an abrupt retouch. This implement appears to be complete, and is much too thin and carefully worked to be a reject from the adz workshops. It was identified by natives as a scraper. (See Pl. XLVIII, *E*, 2.)

RUBBING STONES

The Marquesans used rubbing stones in the manufacture of various wooden objects and in dressing the large stone slabs which are a common feature of their masonry. The large rocks upon which adzes were ground and polished have already been described (p. 321) and mention has been made of the probable use of whetstones, but it is uncertain whether rubbing stones were used in the manufacture of other stone artifacts. The modern makers of *popoi* pounders deny their use, and none of the ancient artifacts show a finish which could not have been produced by careful pecking and a final polishing with sand. The large flat 412 324

412 surfaces and true angles of the stone slabs, on the other hand, could hardly have 324 been produced with any other implement. No information as to the form or material of these stone dressing tools was obtained, but it seems probable that they were fragments of cellular lava having a more or less flat, natural surface.

The rubbing stones used in wood working were of two types, abrasive 412 stones, which were used to obliterate the marks of coarser tools and to some ex- 322 tent to shape the object, and burnishing stones, which were used to give a final high polish. All the abrasive stones seen were made from more or less waterworn lumps of coral or coraline limestone, but it appears probable that pebbles of the finer grained cellular lavas were also employed. The texture varied considerably and at least one specimen was so hard and smooth that it could have had little abrasive effect. Several rubbing stones of increasingly fine grain were used in finishing a given object, the last grinding stone being followed by the burnisher. (See Pl. XLVIII, *C*.)

Burnishing stones were small pebbles of even-textured, rather soft rock which were used only in the final stage of manufacture and had no abrasive effect. They were rubbed rapidly back and forth upon the surface to be polished, the workmen exerting a fairly heavy, even pressure. In time they acquired a peculiar glassy polish resembling that of a gastrolith. The smoother the implement the better the finish which it could impart to a bowl, so old specimens were highly prized. (See Pl. XLVIII, *D*.)

PERFORATED STONE DISKS

324 Two perforated stone disks were collected by the expedition, one, of unknown history, being obtained in the valley of Hane, Ua Huka, while the second was found lying among some skulls in a *me'ae* in the valley of Hanapaoa, Hiva Oa. Both specimens are made of rather porous lava. (See Pl. L, *A*, 1-2.) The dimensions are as follows: No. 1, length 3⅜ inches, width 2⅞ inches, thickness 1 inch, width of perforation at surface 1 inch, width of perforation at center 3-16 of an inch. No. 2, length 4 inches, width 3½ inches, maximum thickness 1¾ inches, minimum thickness 1½ inches, width of perforation at surface 1⅜ inches, width of perforation at center ⅜ of an inch. The perforation in No. 1 is almost perfectly centered, that in No. 2 noticeably nearer one end than the other. In both, the perforation appears to have been pecked rather than drilled, and is formed by two conical pits which meet in the middle of the objects in a rough edged orifice. The surfaces of both specimens are rather carefully smoothed.

Both objects were identified by an Atu Ona informant as weights for pump drills, but this explanation does not appear entirely satisfactory. The pump drill was a common Marquesan tool, and if such weights were used one would expect to find many specimens, whereas perforated stone disks are so rare that 324 most natives had never seen one and could offer no suggestion as to their use. The actual specimens are, moreover, poorly adapted for this purpose as No. 2 is quite asymmetrical while the perforation of No. 1 is much too narrow to admit a drill shaft. Perforated disks of this sort are also found in Hawaii as a rare form.

SINKERS

Stone sinkers were used with at least one of the Marquesan types of fish- 227 net, but specimens deliberately shaped for this purpose are extremely rare. Only one object which could be identified as a net sinker was seen. This was a rather crudely finished specimen of coarse lava having an almost globular body terminating in a short knob with a somewhat expanded outer end, in which a shallow transverse groove was pecked. It was about 2¾ inches long and 1¾ inches in diameter. The neck and the single groove across the center of the top are said to have served for the attachment of cords. According to the owner of this specimen, an unusually intelligent native, sinkers of this type were attached to the lower edge of the long seins used in turtle fishing.

A second specimen, clearly related to this form but of such fine finish that its purpose was probably ceremonial rather than utilitarian, was seen in a collection in Taiohae, Nuku Hiva. The body was between 3 and 4 inches in diameter and almost perfectly spherical. The neck was very short and oval in cross section and each of the two parts into which the end was divided had been carved into a flat tiki face directed upward. The specimen appeared to be made of phonolite or some other equally hard and fine grained stone and had been carefully polished on all surfaces. Its heavy patination indicated a considerable age. This sinker, if it is a sinker, bears a remarkable resemblance to certain [171] specimens found near the East Cape of New Zealand, which are identical in outline and in having two heads carved upon the projections at the top. A crudely made object of the same type, now in the Museum of the University of Pennsylvania, is shown in Plate XLIX, *A-B*. The New Zealand sinkers differ from the Marquesan examples in having the body of the sinker covered with elaborate carving.

A stone object in the collection of Mme. Maleius, in Ta'aoa Hiva Oa, can probably be classed as a sinker. It is oval in outline, with one flat and one convex side. Down the center of the convex side a groove has been pecked, giving the whole much the form of a coffee bean. The material is a rather coarse lava, and the whole finish is rough. As far as known no other object of this sort has been reported from the Marquesas and the owner, who was thoroughly conversant with native matters, could offer no suggestion as to its use.

227 In Hawaii artifacts in every way identical with this object are quite common and
171 were used as sinkers for squid hooks. The Marquesas was an important point
of call for whalers in early days, and the first missionaries to establish themselves in the group were Hawaiians, so it is probable that this object was imported from that group during the historic period.

ANCHORS

Native accounts of the ancient fishing methods mention the use of
501 anchors, but it seems probable that these were simply rough stones. A single worked specimen was seen in Taiohae, Nuka Hiva. It consisted of a conical stone of oval cross section about 10 inches high and 7 inches in diameter, through the upper end of which a hole about ¾ of an inch in diameter had been pierced. The natives were unable to identify this specimen, and as it was found among the debris of a trader's store it may be either of European workmanship or due to European influence.

PIPES

276 The use of tobacco in the Marquesas is almost certainly post-European, but
the plant was cultivated there very early in the historic period. Clay pipes in
324 burial caves that contain no other evidences of European contact indicate
[539] that they were among the earliest trade objects and most of the stone pipes appear to have been made at a time when the native culture had undergone little, if any, change. The clay pipes referred to are clearly the prototype from which the stone pipes were evolved, but the Marquesan pipe makers were no slavish imitators and their work shows considerable originality.

The material used was a rather soft, even-textured volcanic rock, and the shaping was probably done with metal tools, although the fine finish of most of the specimens makes it impossible to say whether such tools were always used. The bowl form was like that of the European clay pipes of the early nineteenth century, but the other features vary greatly. The simplest form is shown on Plate XLIX, *C*. It consists of a simple bowl 1⅜ inches long and about ¾ of an inch wide, with a hole pierced in one side for the stem. The bottom of the bowl is decorated with a short cylindrical knob.

A more elaborate specimen, seen in Hanahehe, Hiva Oa, consisted of a similar bowl, without the knob, which had at the bottom two projections ⅜ of an inch long, placed directly opposite each other. Both these projections were drilled
[531] to take stems. The bowl was covered with lightly incised designs which had been almost obliterated by handling. The use of multiple stems appears to have been rather common and according to reliable informants some specimens had as many as four.

By far the most elaborate pipe seen was in the possession of Mr. Frank 276
Varney of Atu Ona, Hiva Oa. It is shaped like the bowl and fore-stem of an 532
ordinary straight brier pipe, but has a tiki figure carved against the curve of the bowl in three-quarter round. (See Pl. XLIX, *D.*) The convention of this little figure is curious; the eyes are indicated by raised circles on either side of the head, and there is no distinct mouth or nose. A small beak-like projection at the bottom of the head, between the eyes, suggests that it may represent a bird. A hole has been drilled between the figure and the pipe bowl at about the level of the waist. This pipe is known to be very old and has been in the possession of a single family in Atu Ona for at least three generations.

BOWLS AND TRAYS

Stone bowls and trays are rare in the Marquesas, and the few specimens 415
extant vary greatly in form and finish. The larger objects of this sort are
usually quite crude. Some of the smaller bowls, on the other hand, show [324]
great skill in manufacture and are well finished and even decorated.

The largest object of this sort seen was a so-called tray which was built into the upper edge of a small platform in the *tohua* of Hutuhu'u, valley of Taipi-Vai, Nuku Hiva. It appeared to be a large fragment of a lava bubble which had been smoothed and slightly excavated on the inner surface, the outside being left rough. It was 3 feet, 6 inches long, with an average width of 2 feet, and an external depth of from 6 to 9 inches. Its form was likened by the natives to that of a canoe, a small natural projection at one end being pointed out as the prow, but the depression was really roughly rectangular. It is said that the bodies of victims who were to be eaten were laid upon this tray, but no other data could be obtained.

Another large bowl or tray of an altogether different form and use, was seen in the island of Tahu Ata. It apparently had been made from an oval water-worn bowlder, the outer surface left unworked. It was seen in the course of a visit so brief that exact measurements were impossible but the dimensions were approximately as follows: length 2 feet, 6 inches, width 20 inches, external depth 18 inches. The depression was circular, narrowing toward the bottom, and was about 14 inches in diameter and one foot deep. The rim was flat and rather carefully smoothed. Upon one end of the rim there was a cylindrical projection about 3 inches in diameter, and of the same height, which was said to be the base of a small tiki figure about one foot in height which was carved in one piece with the bowl. This little figure had been broken off and carried away many years ago. The bowl was built into the pavement of a large dwelling *paepae,* but informants were not certain that this was its original position. It was so heavy, however, that several men would have been required to move it and it must have been fixed in some special place. It was said to have been used to dye tapa with saffron.

A third stone bowl was seen in the valley of Pua Ma'u, Hiva Oa, and is known to have been the property of the last queen of that valley. It was made of red tuffa of the sort ordinarily employed for large stone slabs, and was very roughly finished. The dimensions were as follows: diameter, 18 inches; external depth, 14 inches; thickness of rim, 3 inches. It was said by the owner to have been used to keep fire in, in the house at night, but this seems to have been an unusual practise and no other bowls of the sort were known to the natives.

A peculiar stone tray was collected in the valley of Taipi Vai, Nuku Hiva. This specimen is made of rather coarse lava, worked all over but poorly finished. The outside is decidedly asymmetrical—somewhat oblong in shape with rounded ends. One end of the tray has a curious flat projection running from a short distance below the rim down the outside of the bowl to the bottom. This projection is 5½ inches long, 3¼ inches wide at the upper end and 2 inches wide at the lower end, at the top it is 1 inch thick, at the bottom ½ an inch. The upper end and sides of the projection are somewhat undercut, and a shallow transverse groove runs across the lower end ¾ of an inch above its tip. The internal depression of the tray is nearly rectangular, 11 inches long, 7¼ inches wide and ¾ of an inch deep. The bottom is flat, the sides curving upward abruptly. The outer surfaces of the tray recurve slightly at the rim. The dimensions of the tray are: length, 14⅜ inches; width, 9¼ inches; maximum thickness, 4½ inches. This tray was used by its owner to grate saffron root and was described by him as an heirloom. There is good evidence, however, that he found it while clearing land only a short time before its purchase and its ancient use remains uncertain. (See Pl. L, *B-C*.)

The specimens described have all been of large size and rather crude workmanship. Certain fragments in the collection of the Bishop Museum, however, prove that there were in the group small and finely made stone bowls. No. B3699A is a fragment of a bowl or tray, its size being too small to make exact determination possible. The material is some soft, rather close-grained, grey stone, and the whole surface, including the fracture, is heavily patinated. The walls are about ⅜ of an inch thick, and the internal depression ¾ of an inch deep at the rim. The rim is flat, and the object appears to have been finely finished on all surfaces. Another fragment (No. B3699B) is of a small circular bowl about 6¾ inches in diameter and 2¾ inches deep. The walls are ⅜ of an inch thick at the rim and about 1¼ inches thick at the bottom. The outer sides recurve slightly at the rim, which is flat with rounded edges. This bowl was made of some rather hard close grained stone and was finely finished 415 inside and out. Still another specimen (B3699C) appears to be a fragmnet of a rather shallow bowl 8 to 10 inches in diameter. It is made of a soft grey stone, possibly an indurated ash. At the lower end of the curve it bears a chevron carved in high relief along whose center there is a single incised line. It seems probable that this formed part of a zigzag band running around the bowl, but the fragment is too narrow to tell certainly. No. B3699D is a fragment from the side of a rather large and heavy bowl or tray having a bottom thickness of about one inch. The outer surface was smoothly finished and decorated with closely spaced incised lines forming simple curvilinear designs. (See Pl. XLIX, *E.*)

POUNDERS

INTRODUCTION

Pounders were, with the possible exception of adzes, the commonest of Marquesan stone artifacts, 412 and they still form a regular part of the domestic equipment of all native households. In ancient times they appear to have been manufactured to some extent in all the valleys but even in prehistoric days the superiority of the stone found in Ua Pou and Ua Huka had led to a localization of the industry. The finished implements were traded from these islands to the rest of the group. The manufacture of *popoi* pounders has continued in Ua Huka down to the present time, and shortly before the war large numbers are said to have been made for a German trading company which sold them in their stores throughout the group and even in Tahiti.

At the present time the making of *popoi* pounders appears to be essentially 412 a spare time industry, the natives working upon them when they have nothing 32+ more pressing to do.

For the pounders three varieties of stone were formerly used, all of which appear to have been rather soft, even grained magmatic rocks. The best grade was called *otao*, a grey rock, fine grained, strong and light. The second best was called *puhite'a*, and the third best *patako*. All these varieties are said to have been obtained from the high part of the island lying to the east of the valley of Hokatu, but as bowlders in two other valleys were pointed out as good pounder stone, it is probable that the deposits were rather wide spread. The stone does not appear to have been regularly quarried, but was obtained from rock slides and stream beds.

The only tool used in making modern *popoi* pounders is an ordinary steel axe, and even the finishing touches are given with this unwieldy instrument. The process of manufacture is as follows:

An irregular piece of stone about three times the size of the finished implement is roughed out with heavy blows of the axe until it becomes a cone. (See Pl. LI, *A*, 1.) This cone is then worked down by light blows on all sides until the general form of the finished implement is produced. This is then smoothed by light, even blows with the corner of the axe until all the contours are perfect. The neck and body of the implement are then shaved with the edge of the axe until the scratches left by the last process are obliterated. The head

412 324 and base are left rough. The smooth surface of some new and unused specimens would seem to indicate the use of some sort of abrasive for the final finishing, but informants who were themselves makers insisted that this was not the case. The body of the implement is sometimes rubbed with a mixture of coconut charcoal and oil which gives it a shiny black finish contrasting pleasantly with the grey of the head.

Informants of Ua Huka insist that the ancient process of manufacture was essentially the same except that stone adzes were employed instead of the modern steel axe. The stone used on Ua Huka could probably have been worked in this way and the information may be correct for this locality, but in other islands a variety of rock was employed, some of which could hardly have been worked with stone adzes. The heads of many of the old pounders show marks which make it seem certain that they were finished by pecking.

MODERN POUNDERS

412 The modern commercial pounders all conform to a single well-marked type (Pl. LI, *A*, 2).

The pounders are characterized by a neck of oval cross section which expands to form the head and the body of the implement. There is no clear line of demarkation between these parts and it is impossible to say where one ends and another begins. From the neck the body flares outward toward the base, which is circular, so that when seen in profile the sides of the pounder appear concave. The bottom is convex, with a rather low curve, and is always left rough. The head is oval in horizontal cross section, the lower part contracting gradually toward the neck. The upper part has the form of a high rounded dome and is divided into two equal lobes by a transverse groove which extends down either side almost to the point of maximum width of the head. The surface of these lobes is left rough, apparently with ornamental intent, and the whole form is clearly phallic.

ANCIENT POUNDERS

The natives themselves classify pounders according to use, recognizing four distinct classes as follows: (1) *popoi* pounders, (2) pounders for infant food, (3) salt pounders, (4) children's pounders. They also recognize certain of these implements as forming a fifth distinct class whose use has been forgotten. As these native classifications according to use are correlated with differences in the size and form of the implements, they will serve as the basis for the present descriptions.

POPOI POUNDERS

Popoi pounders are numerically much more important than those of any other class, practically all large pounders belonging under this head. They are divided by the natives on the basis of size and weight into men's and women's pounders, the larger implements being used by the men. All *popoi* pounders are known by the generic term *kea tuki popoi* (stone to beat *popoi*) but those having flat heads are also known as *opu* (stomach). The phallic forms do not appear to have had special names. The term applied to the tiki-headed pounders was descriptive, meaning carved pounder.

412

All *popoi* pounders agree with the commercial pounders in the form of the body and base. The necks range in cross section from oval to round, but the differences appear to be more or less accidental and are not correlated with other features. The range in size does not appear to have been very great, the ancient specimens seen varying in height from 7 to 8½ inches and in base diameter from 4½ to 5¼ inches. The variation is about the same in all subtypes. The subtypes are therefore based entirely upon differences in the form and decoration of the head.

The simplest form of *popoi* pounder appears to be the flat topped type called *opu*. In the plainest specimen collected (Pl. LI, *B*, 2) the neck is circular in cross section and expands only slightly at the top, the upper end being slightly convex. The curve of the bottom is unusually high. More commonly in this type the neck is more or less oval in cross section and the upper end shows a more marked expansion, its surface being flat or slightly concave. (See Pl. LI, *B*, 1.) In one specimen, which could not be obtained, the ends of the oval head projected beyond the neck in finely made flat flanges not more than one-fourth inch thick. A further modification of the *opu* type consisted in encircling the neck some distance below its upper end with a raised ring. (See Pl. LI, *B*, 3.) In view of the shape of one of the specimens of phallic form it seems probable that the idea here is phallic also. *Popoi* pounders of the *opu* type were seen only in the island of Hiva Oa, and as all the specimens were of local rock it seems possible that this was peculiar to Hiva Oa. [83]

The phallic type of pounder is much more common than the *opu* type and appears to have been the dominant form throughout the Marquesas. It may be subdivided into simple phallic representations, and the tiki headed pounders, which are clearly derived from the simple phallic form.

A single specimen (Pl. LII, *C*) may link the phallic pounders with the ringed specimens of the *opu* type. The neck of this implement is encircled a short distance below its upper end by a raised, smoothly rounded ring. The space above this ring is dome shaped and ungrooved. The whole appears to be a phallic representation.

The normal form of phallic pounder is well illustrated by the specimen shown on Plate LII, *A*. In this the neck expands smoothly to form a head of almost rectangular cross section, there being no line of demarkation between the two parts. The transverse groove is deep and the sides slope inward steeply. The ends are almost vertical and the top on either side of the groove is flat. The whole surface is treated as a series of slightly convex planes which meet in well marked angles. This angularity is most pronounced in No. 1. Most of the phallic pounders seen had this form and it is probably the prototype from which both the modern commercial and tiki headed pounders have been developed.

Two phallic pounders, shown on Plate LII, *B*, differ slightly from this normal type. The head of No. 1 is oval in cross section, the sides slope inward

412 rather abruptly, and the ends are almost vertical. The top bears a longitudinal groove instead of the usual transverse one. In No. 2 the head is smoothly rounded, with a short transverse groove.

Tiki Headed Pounders

412 531 Tiki headed *popoi* pounders represent the highest development of Marquesan stone working, the only objects which approach them in excellence being certain of the small stone figures. The expedition was fortunate enough to obtain five perfect specimens and the carved head of a sixth, while ten others were studied in private collections or from photographs. In all of these pounders the carving followed one or the other of two well-marked conventions and the series appears large enough to make possible a fairly accurate study of the type. In spite of their fine workmanship and present rarity tiki headed pounders were, and in some cases still are, used as ordinary household utensils. All informants agree that the carvings are purely decorative and have no religious significance.

[324] In general form the tiki headed pounders agree perfectly with the angular headed type of phallic pounder already described, and it seems certain that they have been developed from these implements. According to informants the carving was done with sharks' teeth or rats' teeth, but the form of the carving tools and the method of employment have been forgotten. In the actual specimens the grooves of the carving are semicircular in cross section and exhibit a high polish.

The decoration consists of two heads, formed by carving a face upon each of the lobes of a phallic pounder of normal angular type. In carving these faces two distinct conventions were employed, one of which appears to have been rare, being shown by only three of the sixteen specimens. In the normal convention the features are carved in low relief and the decorated top is set off from the neck of the pounder by a well marked groove. Each of the faces covers the entire surface of a lobe, its center line being in the middle of the outer end. The mouths are broad, in the form of long narrow ovals with rounded ends. The tongue is shown as a narrow longitudinal ridge, and the lips are broad, with a flat or slightly concave surface. In one specimen there is a narrow band between the lips and the tongue, which may represent the teeth. Immediately behind each corner of the mouth a small decoration in the form of a "V" is sometimes carved. The nose is broad and flat, with almost semicircular nostrils. The eyes are carved on the upper corners of the lobe and are directed toward the side rather than forward, and the space between them is disproportionately wide. The eyes are of the usual spectacle form—a raised ring encircling a convex center—and are connected to the base of the nose at the inner end and to the ear at the outer end by narrow raised bands. As a rule the eyes are horizontal, but some specimens show a slight upward or downward inclination. The ears are represented as double scrolls, and are so placed that their outer edges fall along the line of the inner edge of each lobe. There is a well marked groove above either eye. The top of the head may be either rounded or pointed, while in one specimen broad flat grooves have been carved along either side above the eye groove, giving the head a sharp central keel. The space on the side of the pounder below the ears and between the corners of the mouths of the two faces is filled with either one or two small block figures bearing incised designs. In one specimen (not shown) a small block figure of this sort is placed in the middle of the forehead of either face.

The characteristics of the rarer type of tiki headed pounder (Pl. LIV, *A*) are as follows: 412 531

> The features are carved in high relief and the whole effect is that of two heads made in the round and placed back to back, the faces projecting out beyond the oval neck at either end. The mouth is narrower than in faces of the common type and has a greater vertical width. The lips are thin and rounded and the tongue broad and prominent. The nose is small and almost naturalistic in its proportions, and juts out from the face. The eyes are large, with upper and lower edges of differing curve, a high rim, and a well marked longitudinal ridge across the eye ball. They are directed to the side, and the rear corners slope downward and backward so steeply that the ears, shown as simple hooks are at the level of the corners of the mouth. The top of the head is rounded and only slightly higher than the upper edge of the eye rings.

The finding of three specimens of practically identical form seems to indicate that these objects constituted a distinct type, but the natives can give no information on this point. The convention of the carving differs considerably from that employed on any other artifacts but is reminiscent of that of certain large stone heads used as architectural decorations. Pounders of this sort are certainly pre-European and it seems probable that they either had a special ceremonial significance, or were the product of some local school of carving which became extinct at an early time.

POUNDERS FOR INFANT FOOD

Special pounders were used to crush the fresh water shrimps which were fed to infants as a purgative before they were suckled for the first time. (See Pl. LIV, *C*.) They are smaller than the *popoi* pounders, and have an oval instead of a round base, only slightly concave sides, and no distinct neck. The top is oval in cross section and usually projects slightly beyond the body at either end. In the best made specimens the top is usually slightly hollowed along its center, but in one specimen it is smoothly rounded. In using these pounders, the body of the implement was grasped in the hand with the index finger extending lengthwise over the top, and the shrimps were crushed with a grinding motion rather than direct blows. 412 [853]

SALT POUNDERS

Certain small pounders are said by the natives to have been used for grinding coarse salt left in hollows of the rocks by the evaporation of sea water. These appear to have been fairly common in the island of Nuku Hiva but are rare or lacking elsewhere in the Marquesas. They are characterized by a long, thin headless neck, or body, which flares out rather abruptly at the base. The base is either round or oval. (See Pl. LIV, *D*.) 412 263

CHILDREN'S POUNDERS

A few very small pounders which were seen in the Marquesas were said to have been toys; although, as some of them showed considerable wear, they may 412 524

412 524 also have been used as pestles to grind medicines or pigment. According to informants little pounders of this sort were made for an adopted child in order that he might pound food for his pig. All those seen were miniature reproductions of *popoi* pounders, although never of phallic type. One specimen, of *opu* type, is only 3¾ inches high and 3 inches wide at the base. (See Pl. LIV, *B.*)

CONICAL POUNDERS

412 531 The natives recognized Conical Pounders as a distinct class, but they appear to have no name for them and can assign no special use; so the recognition is probably nothing more than a realization that these implements differ from all other pounders and cannot be placed in any of the regular categories. They are rare; only five examples were located.

The conical pounders are characterized by heavy conical bodies which entirely lack the slender neck and graceful bottom flare of ordinary *popoi* pounders, and by the peculiar finish of the upper end, which bears a short transverse grip. In four of the five specimens this part is carved. In the uncarved specimen, the grip is formed by two short cylindrical knobs which jut out from opposite sides of the top of the implement. Between their inner ends there is a rounded transverse ridge. (See Pl. LII, *F.*) Two of the carved pounders are large and two small. The size, shape and decoration of each pair are so closely similar as to indicate that they are either the work of the same artist or examples of an established type.

In the small pounders (Pl. LII, *D*) the grip is carved into a single human head, disproportionately large, with the face up.

The treatment of the head is decidedly naturalistic, the face being long and narrow with a projecting jaw. The mouth is almost circular, with thick rounded lips and a protruding tongue. The nose is high, with a sharp bridge; the cheeks sunken; and the eyes are in the form of long ovals, with a slight groove indicating the lower lid. The ears are indicated by shapeless knobs which are set above the level of the outer corner of the eye and do not appear to be connected to it. There is a suggestion of a smoothly rounded supra-orbital ridge. The head above the face is round and disproportionately short, its back projecting only slightly beyond the neck of the implement. In both specimens the execution is rather poor, the eyes being at slightly different levels.

In the large pounders (Pl. LII, *E*) the horizontal grip is divided into two equal parts by a transverse groove.

Each of these lobes is carved into a head, chin out. These heads, although worked out in less detail, are evidently much more closely related to these on the small pounders just described than to the ordinary Marquesan convention. They show the same projecting jaw, high nose, sunken cheeks, long oval eye, and knob ear. The mouth is not indicated. The carving is remarkably angular, suggesting the use of metal tools, but from certain details of the specimen examined it seems certain that they are pre-European.

These conical pounders offer an interesting problem, for they differ considerably from all other Marquesan types in both shape and decoration. The uncarved specimen was said by its donor to have been found in a sand dune in a small valley on the north side of Nuku Hiva. It is heavily patinated, suggesting a considerable age. Of the carved specimens, one large and one small specimen are from Nuku Hiva and the other two from Hiva Oa.

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In all five pounders the material appears to be local, and as the use of carved decoration on pounders is limited to the Marquesas, the theory of importation may be discarded. The heads carved on the small examples show a slight resemblance to those carved on the rarer type of tiki headed pounders, but the angularity of the features on the larger specimens finds no parallel in other Marquesan work. A similar angularity was noted, however, in some of the wood carvings in the Society Islands. The form of these specimens also finds a fairly close parallel in certain small specimens from Tahiti and in certain pounders of coral rock from the Austral Islands. The similarity of the decoration on all Marquesan conical pounders seems good evidence that it represents a distinct convention which was in some way linked with the conical form. The best explanation of these facts seems to be that the conical pounders are hybrids which owe their shape, and to a lesser degree the convention employed in their decoration, to a Southeastern Polynesian influence. An alternative explanation is that the conical pounders are archaic and that their carving shows a technique which is more primitive than the historic Marquesan convention.

COMPARISON OF MARQUESAN POUNDERS WITH OTHER POLYNESIAN TYPES

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Stone pounders appear to be entirely lacking in Melanesia unless we include under this head certain heavy, bottle-shaped implements used for cracking nuts in the Solomon Islands and some archaeological finds in New Guinea. In Micronesia, stone pounders were used in the Marshall and Caroline Islands but seem to be lacking in the Gilbert Islands. In the Marshall Islands at least, they were used side by side with wooden pounders of identical shape. All the Micronesian pounders appear to be of one type, with some minor variations in the treatment of the upper surface of the head. They have been frequently described and figured.

The pounders of Polynesia must not be confused with the pestles which were found in many parts of Polynesia, but seem to have been unknown in the Marquesas.

Stone pounders do not appear to have been used in Samoa or Tonga but are found everywhere in marginal Polynesia with the possible exception of Easter and Chatham Islands. The New Zealand pounders appear to be pestles rather than true pounders and bear little resemblance to the other Polynesian forms. The absence of broad based pounders in New Zealand is of little significance in a comparative study, for these were specialized implements used principally for crushing breadfruit or taro and would have been of little use there, 412 171 but their absence in Western Polynesia is of great interest and would seem to indicate a well marked difference in culture.

If we exclude the curious stirrup pounders from Kaual in the Hawaiian islands and the New Zealand fern root pounders, we find a general similarity among Polynesian implements of this class. There are many minor differences in shape, permitting of the creation of a great number of subtypes, but the major differences appear in the finishing of the upper end or head. On the basis of these differences in head form we may divide the pounders into four types: domed, flat, phallic and transversed gripped. The domed form is characteristic of most Hawaiian pounders and seems to be limited to that group. The flat form appears as a minor type in the Marquesas and possibly in Hawaii, but is lacking elsewhere in Polynesia. It is normal in Micronesia, however. The phallic type is limited to the Marquesas. The transverse grip type is normal throughout Southeastern Polynesia, where it shows many local variations, and occurs as a very rare form in the Marquesas.

The normal Marquesan pounders resemble those from the Society Islands more closely in the form of the base, body and grip than they do those from Hawaii, but their phallic heads are more nearly related to the Hawaiian domed than the Southeastern transverse grip type.

STONE FIGURES

532 The Marquesans excelled all other Polynesians in the manufacture of stone figures. Although none of their carvings equalled the great Easter Island statues in size, they ranged from large figures over eight feet high to little statuettes scarcely six inches tall. Between these extremes there were all gradations in size. For the sake of convenience the statues will be divided into those which were intended to be permanently set up and those which were portable, only the portable one being considered here. A single object of uncertain significance, which does not belong in either of these classes, will also be described.

532 778 A number of small stone figures of fish were used in the *me'ae* of the fishermen. These figures were used one at a time and those not in use were buried within the precincts. The figure in use was placed upon an altar within the main house and was kept there as long as the catches were good. If the luck changed it was removed and replaced by another. According to a different account, which could not be correlated with the above, the small fish figures were the property of ordinary individuals. When the owner went fishing he took the image with him and threw it into the sea, and so great was its mana that on his return he would find it again at a given place, to which it had supernaturally returned.

None of these fish figures were obtained by the expedition and they are rare in collections. Those seen were for the most part of cylindrical or flat oval form, poorly finished and having incised upon one end a rude representation of a fish's head. In one specimen the only feature indicated was the curve of the gill cover. A single very fine specimen in the collection of M. George La Garde of Tahiti has a flat base and high back which slopes upward almost to a point. It is highly polished all over, and bears upon one end a carved head of human or semi-human type. 532

The small human figures were of two types, single and double. They were used in healing the sick, and also as real votive offerings. They were made by special *tuhuna*, and were carried to the *me'ae* of the god invoked and there left by persons desiring success in any enterprise. (Handy, personal correspondence.) [778]

The single figures show more or less variation, but all appear to fall between the extremes represented by two specimens in the Bishop Museum's collections. Plate LV, *A* shows a short squat figure having a large head with a projecting jaw.

The features are like those of the heads of tiki headed *popoi* pounders of normal type except that the ears are represented as simple knobs. The head is set directly on the shoulders, and the bottom of the jaw is some distance below the level of the top of the shoulders. The arms are thin and unmodeled with short upper and long lower parts, and are shown flexed, with the hands resting upon either side of the body in front. The space between the upper arm and the body is pierced, while the lower arm is carved in high relief and the hand in low relief. The fingers are barely indicated. The back of the figure is concave with a well marked ridge across the shoulders. The breast slopes outward and downward from the head to the level of the hands, and the stomach, between the hands, is shown as a rounded protuberance. The legs are short and are shown in a flexed position, the upper edge of the thighs being parallel to the forearms. The thighs are thin and the buttocks project in the rear as a flange. The lower leg is very heavy, and is separated from the thigh by a horizontal groove which runs across the back and around to the middle of the outer side of either leg. The space between the legs is pierced nearly to the level of the knee. The lower leg tapers slightly toward the foot, which is represented by a thin flange, longest in front. In the middle of the side just above this flange, there is a small knob, probably representing the ankle bone. The sex of this figure is not indicated. A raised band, running from the back of the head to the middle of the shoulders, is pierced with a transverse hole which probably served for the attachment of a cord. The dimensions are: height, 7 inches; maximum width, 4 inches; shoulder width, 3 inches; length of head, 2½ inches; width of head, 2½ inches. The whole surface appears originally to have been polished, even the bottoms of the deepest cuts being rubbed smooth.

It is evident that the maker of this figure possessed remarkable technical skill, and its grotesque proportions can only be explained by the assumption that he was not attempting to represent an actual human being, but to reproduce an established convention. The majority of the small stone figures agree more closely with this specimen, especially in facial type, than with the one about to be described.

532 Figure *B*, on the same plate is also highly conventionalized, but it appears less grotesque. It is of nearly the same height, but the figure is more slender and the proportions more nearly approach those of the human body.

The head is large and is set directly upon the body, but the mouth is smaller than in *A* and the nose is rather small and naturalistic, with a high bridge. The eyes are shown as long ovals having a raised rim and central ridge, and are connected with the nose by narrow bands. Above each eye there is a raised band whose inner end connects with the base of the nose while the outer end, behind the eye, thickens to form a small ear flange. The arms are carried in the same position as those of *A* and are unmodeled, but the proportions of upper arm and fore-arm are almost natural. The fingers are not indicated. The body is proportionally much longer than that of *A*, its sides are rounded, and the whole treatment is surprisingly naturalistic. The back of the body is nearly straight. Along the middle of the top of the shoulder there is a well marked ridge running from the head to the shoulder tip. From the tip of the shoulder a second ridge slopes downward and forward across the chest, its inner end curving upward abruptly toward the throat. This probably represents the line of the collar bone. A short distance below this line there are two small smoothly rounded protuberances which represent the breasts, while the navel is shown by a small circular pit placed midway between the hands. The sex, male, is indicated by a small conical knob. The short legs are flexed, but the thigh is rounded and the buttocks project to only a natural degree. The lower leg is thick and heavy, and the foot is large. The ankle bone projection is well marked. The back of the head was pierced for suspension by boring two holes, one downward from the top, and the other upward and forward from the bottom.

The convention of the double figure (Pl. LV, C) corresponds approximately to that of the single figures just described.

The two figures are placed back to back and joined at the buttocks and at the shoulders or backs of the heads. The form of the head differs somewhat from that of the other two figures described, and one figure has a hand to the mouth, a pose not uncommon in Marquesan art.

A curious object shown on Plate LV, *D*, which may have been a votive offering or have represented a deity, was found in an old *me'ae*.

This article is a roughly conical piece of cellular lava which appears water worn and shows no signs of working except at the upper end where it has been carved into two heads, set back to back and separated by a groove. The stone is so coarse that it is impossible to determine the convention of the carving. The lower end of the object is smoothly rounded, and but for its size and weight the whole might be taken for a very crude *popoi* pounder. Natives could throw no light on its use.

Stone figures appear to be entirely lacking in Samoa and Tonga, but small figures are found throughout most of marginal Polynesia. They are numerous only in the Marquesas. Fish figures are found in Hawaii, the Marquesas and Society Islands, although there is little information as to their use and significance in Hawaii. Small human figures occur in Hawaii and the Society Islands, but are rare in these localities. The little kumara gods of New Zealand are well known and appear to be fairly common. The figures from the different localities seem to conform in every case to the local convention and have little in common.

MISCELLANEOUS TOOLS

Quiros (51) says that the Marquesans used adzes made from thick fish bones or shells. This is the only evidence of the occurrence of these implements in the Marquesas and as no examples are known, it seems probable that Quiros confused the Marquesas with some of the low coral islands visited on the same voyage. 412 321

Sharks' teeth, hafted in various ways, were formerly used as knives and carving tools, but no specimens seem to have survived and the methods of hafting have been forgotten by the present natives. According to Langsdorff (38, p. 175) the teeth from the lower jaw of the shark were used as substitutes for gimlets or awls, being fastened to wooden handles. Sharks' teeth, apparently unhafted, were also used as razors. The hair was gathered in small bunches and the tooth sawn back and forth across it at the roots. [325] [302]

Very few bone tools appear to have been used in the Marquesas. Fleurieu (23, p. 135) mentions the use of bone awls. Narrow wedge-like implements of bone or hard wood were used to pound the feather caulking into the bow and stern seams of canoes. Bone knives are described on page 351.

A number of shell implements appear to have been employed in wood carving, although we have no information as to their form. The grooves in *toa* wood tapa beaters are said to have been cut with pearl shells ground to a keen edge, and the handles were shaped with a small black shell, called *mama*. Fleurieu (23, p. 135) says that the Marquesans used "pieces of shell of different shapes and sizes, sharp or toothed like a saw." Knives made from whole pearl shells ground to a sharp edge were used for a number of purposes. There appears to have been no clear distinction between these and the shell scrapers used in tapa making.

Rasps made from the skin of the shark or giant ray were used in shaping clubs and other objects made from the hard *toa* wood. They were made by wrapping the skin around a smooth stick while it was wet and soft. One end of the stick projected a few inches beyond the skin, forming the handle. (See Pl. LVI, *A*.) Fine shark skin, apparently not mounted, was used in polishing bowls and other wooden objects. Sections from the tail of the giant ray were also used as rasps, requiring no preparation other than drying. These tail rasps have continued in use until modern times for the grating of sandal wood, although recently they have been supplanted by files. The spines of the sting ray are said to have been hafted and used as saws. 412 322 237

Chisels edged with rats' teeth were formerly used by expert Marquesan artisans in the carving of hard stone. None of these implements have survived, 412 324 [237]

412 and the method of hafting is problematical. The objects carved with rats' [324] teeth indicate that the work was done by continued rubbing rather than by strokes of the chisel, as the bottoms of the carved lines show a high polish.

The most important wooden tool appears to have been the mallet. This was employed with the chisel in shaping and carving wooden objects, and was also used with caulking tools. Mallets were made of *toa* wood, and were short [324] and heavy. The specimen shown (Pl. LVI, *B*) is 11 inches long, with a maximum width at the head of 4 inches, and a maximum thickness of 1¾ inches. The handle of the mallet was round or rectangular and was frequently pierced near the outer end for the attachment of a wrist loop. The head was pear shaped in outline, expanding and thickening gradually toward the outer end. The sides and end of the head were flat, with a surface at right angles to that of the broad surfaces. In use the blow was struck with the broad face, not with the edge.

No specimens of the ancient caulking tools were seen, but those used on the bow and stern seams of canoes are said to have been wedge shaped. Those used for the lashing holes along the sides were simply pointed sticks with a flat upper end. The favorite material for these implements was *toa* wood.

A long needle of hard wood (Pl. LVI, *C*) was used to sew on house thatch and to pass the cord used in canoe lashings through the lashing holes. The specimen collected is slightly over a foot in length. On one side of the point there is a short barb. The butt has a small knob, to which the cord was attached.

The pump drill was the most elaborate of the Marquesan tools. Apparently no examples have been preserved, but their form and method of use are still remembered by the older natives. The Marquesan drills appear to have been identical with those used elsewhere in Polynesia, although there are indications that some of them were equipped with stone whorls, a rare feature. According to informants, drill points were made in ancient times from a sliver of stone, a shark's tooth, or a rat's tooth. All these materials were replaced at a very early date by iron nails obtained from Europeans.

DOMESTIC IMPLEMENTS

This section deals with the artifacts, other than containers, which formed part of the equipment of a Marquesan household. The implements were for the most part used either in the collection or preparation of food. 128

TOOLS FOR FIRE MAKING

Fire was made in ancient times in the Marquesas by means of the fire plow, a method common to all Polynesia. The fire plow consisted of two parts, the bed and the plow (Pl. LVI, *G*.) 372

The favorite material for the bed was a large dry stem of the fruit cluster of the coconut palm which, being fibrous, aided in the collection and retention of dust upon which the success of the operation depended. The second best material was fau wood. The bed was not as a rule shaped, but in the better specimens its top was flattened slightly to prevent the plow from slipping during the first few srokes. A little earth was sometimes rubbed on the bed at the beginning of the operation to increase the friction. [824]

The plow was simply a short stick, usually of fau wood, sharpened to a straight or slightly convex edge, about one-fourth of an inch wide.

In fire making two men were usually employed, one of whom held the bed firm while the other manipulated the plow (Pl. LVI, *H*).

The bed was placed upon the ground with the end toward the plowman slightly elevated. The plow was grasped in both hands, forming an angle of about 45 degrees with the bed, and was rubbed rapidly back and forth, care being taken to stop each downward stroke at exactly the same point. As the rubbing continued, a groove was formed in the bed and a small pile of wood dust collected in the lower end of this groove. The speed of the rubbing was gradually increased until both groove and plow were smoking; then, at the right instant, the point of the plow was driven slightly beyond the end of the previous strokes and buried in the dust. A spark was thus kindled and gently blown to a coal, then dumped off into tinder made from tree cotton or shredded coconut fiber. A new groove was made each time fire was to be kindled.

In spite of the introduction of matches practically all adult Marquesans can still make fire by this process, and the time required is surprisingly short. One expert individual repeatedly made fire in between 25 and 30 seconds. The process requires a perfect muscular control which is only acquired with long practise, the trick lying in stopping all the strokes at exactly the same point and lengthening the last only enough to bury the plow in the dust without scattering it.

Native informants insisted that fire was kindled in ancient times by striking sparks from two stones, but it seems probable that this process was borrowed from Europeans at such an early time that its origin has been forgotten. Fire making sets consisting of quartz crystals, a piece of steel, and a section of bamboo filled with tree cotton are still used by the poorer natives.

IMPLEMENTS FOR COLLECTING AND PREPARING BREADFRUIT

413 245 Breadfruit is still the Marquesan staple, and utensils for collecting and preparing it form part of the equipment of every family. These utensils may be divided into two classes, those used in collecting and transporting the fruit, and those used in preparing it for food.

NETS AND CARRYING STICKS

245 286 Breadfruit nets are of two sorts, small picking nets and large carrying nets. The picking net consists of shaft and head.

413 [824] The shaft is a long straight pole of some light wood, usually fau. The head consists of a net woven on a forked stick, one foot to 18 inches long. The fork is tied to the shaft and is bent backward so that it stands almost at right angles to the shaft. The wood of a tough vine is usually used for the fork, the angle being given by bending the wood while green and tying the prongs back to the shaft until the wood dries. Within the fork, which is six to eight inches long, a small net is woven having a depth of eight inches to one foot. Commercial string is used for these nets, replacing the sennit of former times. The mesh of the net is large and the knot is like an European square knot. In use, the picker is lifted until the fruit is enclosed in the net; the stem is then caught in the angle of the fork and broken by a slight twist. The fruit are usually picked one at a time and transferred from the picking net to the carrying net, which is hung in the trees near the picker. The average carrying net is about 18 inches in diameter and three feet deep. This net (Pl. LVII, *A*) is also usually made of commercial cord, although sennit is still used. The top of the net is held open by a hoop made from a sapling about three-fourths of an inch in diameter, which has been steamed in an earth oven until it is pliable, bent until the ends overlap, and the juncture covered with many laps of cord. The net is suspended from the carrying stick by three ropes of twisted bark, woven together in the center to form a loop, the ends of ropes being tied to the hoop at equal intervals. The bottom of the net is finished with a ring about two inches in diameter made from two strands of sennit. About this ring the bottom strands of the net are passed in closely spaced double half hitches.

482 Carrying sticks (for transporting the fruit to the house) are simply poles one and a half to two inches in diameter cut from the nearest clump of fau. In ancient times, more carefully made carrying sticks are said to have been used; smoothly finished, and with notches at either end protected by a raised flange. No specimens were seen, and it is probable that even then ordinary carrying sticks were nothing more than saplings.

IMPLEMENTS FOR PREPARING BREADFRUIT

252 413 The implements used in preparing breadfruit vary according to whether the fruit is to be made into *ma* and stored, or is to be eaten at once. In *ma* making large numbers of the fruit are gathered and piled up to ripen. The ripening is hastened by piercing each fruit at the stem end with a pointed stick (Pl. LVII, *D*) or with a piece of crushed bamboo. When the bamboo is used, it is broken off at the surface each time, leaving a fragment of the bamboo in the fruit.

A special tool (Pl. LVII, *C*) made from the shell of a cowrie (*Cypraea mauritiana*) is used for peeling the ripened fruit. 413 252

An oval hole with sharp edges is ground through the rounded end of the shell. At the opposite end the top is broken away, the base of the shell and a strip across the center being left intact. When in use, the shell is held in the hand transversely, with the base against the palm and the sharp edge toward the outer side of the hand. It is moved downward and away from the body. The peelings cut off by the sharp edge pass through the shell and fall out at the rear aperture like the shavings from a plane. These peelers are remarkably rapid and effective, superior to any European tool for peeling breadfruit.

It is interesting that an identical tool is used in Kuschai, in the Carolines, although it is not reported from other parts of Micronesia. It is impossible to outline the Polynesian distribution of this tool. It was used in the Society Islands, but not in Hawaii, and seems to be absent in Tonga. [171]

When properly ripe, the breadfruit are soft enough for the raw pulp to be easily separated from the core with the fingers. Slightly unripe fruits are sometimes cut up for *ma* making. In ancient times this was probably done with a wooden breadfruit splitter. An implement of this sort in the Bishop Museum is eight inches long, with a maximum width of four inches. (See Pl. LVII, *B.*) It has a long oval blade terminating in a broad flat knob. Only the outer end of the blade is sharpened. It is made of some rather hard, light weight wood.

Fresh breadfruit are roasted on an open fire, the proper moment for removing them being determined by the sound they give when tapped with a stick. They are lifted from the fire with two sticks, or, in well equipped households, with tongs. 252 412

These tongs are made from a single straight piece of wood, preferably *mio*, about 2½ inches in diameter and 3 to 4 feet long. The wood is split for the lower two-thirds of its length and the ends spread apart. A few turns of fau bark are usually tied around the upper part of the stick to keep it from splitting in two. Tongs of this sort are also used to arrange the hot stones used in the earth oven, or *umu*. [824]

The charred outer surface of the breadfruit is removed with a knife of wood or bone. Most of the wooden knives appear to have been simple sticks with one end fashioned into a thin blade. Any wood, even that of the fau, might be used. (See Pl. LVII, *E.*) The bone knives are more carefully made (Pl. LVII, *F.*) As all those seen were shaped from the leg bones of cattle it seems doubtful that the type is an ancient one.

The upper end is squared and rubbed smooth, the natural swell of the bone at the joint giving the handle a slightly expanded butt. The blade is formed by grinding away one side of the shaft. The average knife is 9 inches long, with a blade length of 4 inches. The blade is 1½ inches wide at the base, tapering toward a broad rounded point.

After peeling, the breadfruit is dropped into the *popoi* trough, cored, and beaten into a paste with the *popoi* pounder.

415 252 The *popoi* trough is usually made from breadfruit wood. An average specimen is 5 feet long and 16 inches wide, with square ends, straight sides, and a rounded lower and slightly excavated upper surface. In new specimens the depth of the hollow rarely exceeds 1½ inches but in old specimens it may be as much as 3 inches deep in the center, due to wear. In one very old *popoi* trough, evidently maue with stone tools, the interior had been hollowed with fire. The dimensions of individual *popoi* troughs vary considerably, but those used in Nuku Hiva are on the whole shorter and broader than those used in the southern islands.

IMPLEMENTS FOR PREPARING COCONUTS

412 252 Coconuts rank next to breadfruit in the Marquesan dietary, but they seem to have been somewhat less important in pre-European times. They are gathered by hand, without special appliances. The first step in their preparation is to remove the thick husk. This is done by means of a pointed stake, about two inches in diameter, which is fixed rigidly in the ground, point up. To husk the nut it is grasped in both hands, struck sharply upon the point of the stake, and twisted away from it, removing a sliver of the husk, the process being repeated until only the inner shell remains. The process appears easy, but it calls for a considerable skill in manipulation. Nuts are usually husked where gathered, to avoid carrying unnecessary weight.

Nuts other than the thinnest shelled drinking nuts are opened by a few sharp blows of a stone given along the line of greatest diameter, an expert being able to break a nut into two almost equal halves in this way. The water in the cavity of old nuts is thrown away, and the flesh itself, rarely eaten, is grated to extract the milk. Coconut graters vary considerably in the details of form, but are all made upon a single principle.

The graters consist of a stool, or seat of some sort, from one end of which an arm projects more or less horizontally. At the end of the arm the actual scraper is fastened. In ancient times this consisted of a piece of rough coral, or of a strip of shell with the upper edge cut into teeth. Much care is expended upon the seat portion of some of these scrapers, which appears the more remarkable as the furniture of a Marquesan home rarely includes stools or other raised seats. To use the scraper the workman places himself astride the seat, and rubs the nut rapidly over the end of the arm, with a downward and outward motion. A bowl placed below catches the fragments of meat as they fall. When a sufficient quantity of the grated meat has collected, water is added and the whole mixed to a paste.

A strainer is then brought into play to separate the milk from the meat.

This strainer is nothing more than a thick bundle of fiber, about one foot in length and two to three inches in diameter, which is spread out and drawn across the bowl toward the workman, gathering up part of the paste. The ends of the strainer are then twisted in opposite directions, enclosing the paste, and the whole lifted from the bowl and wrung out, the liquid expressed falling back in the bowl. The dry meat remaining in the strainer is thrown away and the process repeated until only a thick creamy white fluid remains in the bowl. Two species of fiber are used for strainers, the commoner is that from the husk of the coconut. [824] The finer strainers are made from the fibers of the stem of a long-leaves plant, which in leaf form and habit of growth resembles large garlic, and from a reference in Jardin (33) is probably *Cyperus macreilema*. No attempt is made to separate the fiber from the substance, the stems are simply split into long strips. (This fiber is also commonly employed for kava strainers, but there is a conventional difference in the method of straining the two substances, kava being squeezed with one hand only while coconut milk is wrung out with both hands.) [412 252]

Copra, the dried kernel of the coconut, although not a food, plays an important part in Marquesan domestic economy. The old method of copra making was as follows: 412 245

> The ripe nuts were husked and broken into two equal halves by the methods just described. These halves were tied together, back to back, by wisps of the husk left attached to them for the purpose. They were then hung up high enough to be out of the reach of pigs and left until the kernel was partly dry and had begun to separate from the shell. The meat was then removed with a special tool made of *toa* wood.
>
> These tools (Pl. LVI, *D*) have a smoothly tapering handle whose outer end is pointed, and a flat or slightly concave blade which curves upward toward its tip. In length they range from 10 to 14 inches and in blade width from 1½ to 2¼ inches. In modern copra making these wooden knives have been largely replaced by tools having an iron blade of somewhat similar form. [177]

Tree cotton appears to have been introduced into the Marquesas in post-European times and the appliance used to separate the fiber of this tree from the seeds is probably an introduction (Pl. LVI, *F*). There is some uncertainty on this point, however, and it seems well to describe the tool as though it were a Marquesan invention. [248] [177]

> The instrument consists of a straight piece of fau wood about 20 inches long and ⅜ of an inch in diameter whose lower end is split into four equal parts. Two slivers of bamboo, each about four inches long, are placed in the splits at right angles to each other about two inches above the tip of the shaft and lashed with thin string. The tips of the bamboo and of the splints of the shaft are sharply pointed. To use the implement the lower end is placed in a mass of mixed fiber and seeds and the shaft twirled rapidly back and forth between the palms until a mass of fiber has collected around the points. This clear fiber is then removed and the process repeated until only the seeds remain. It should be remarked that the seeds of tree cotton are not covered with lint and separate from the fiber much more readily than the seeds of the commercial cotton.

MISCELLANEOUS DOMESTIC IMPLEMENTS

Digging sticks were employed in agriculture, also in digging earth ovens and ma pits. They appear to have been simply poles four to five feet long made of some hard wood, *toa, kookuu,* and *piapiau* being the species preferred. The shaft was about three inches in diameter and was sharpened at the lower end into a broad flat edge. In view of the close resemblance between Marquesan stilt steps and the foot rests of Maori digging sticks, it seems rather curious that the Marquesans never hit upon this simple improvement. Digging sticks are no longer used in the group, and no information was obtained as to their exact method of use. 412 [824]

Before the introduction of iron, bamboo knives were used for cutting a variety of soft non-fibrous substances. These knives are now obsolete and no specimens were collected.

412 According to the accounts of informants the bamboo knives were slivers, one-half to
three-quarters of an inch in width, from the stalk of the smaller of the two native species of
[824] bamboo. When first split off, the outer coat of the stem gives a surprisingly sharp edge, but
this soon becomes dull with use. When a knife became dull it was usually thrown away and
another sliver selected; but it was occasionally sharpened by tearing a thin strip off the edge
[782] with the teeth. Jardin (33, p. 53) says that knives made from this bamboo were used to dis-
patch human victims for sacrifice.

Knives made from sharpened pearl shells were used, also stone knives made from long flakes.

373 On the rare occasions when an indoor light is required the natives use
[824] candles made of *ama* nuts. The ripe nuts are baked in an earth oven, the shells
cracked, and the oily kernels extracted whole. These kernels are then strung on
the stiff midrib of a coconut leaflet, the lower end of the midrib being left bare
for some inches to serve as a base, or handle. As far as can be learned no
special candle holder is used. The lower end of the midrib is simply thrust be-
tween two stones of the paved house floor. When ignited, the kernels burn
slowly, with a flickering smoky flame and the light requires constant tending, as
it is necessary to knock off the cinder of each nut with a short stick as soon as
the fire had passed to the one below. It is rather curious that lamps appear
[171] never to have been used by the natives in the Marquesas, although their use was
common in both the Society Islands and Hawaii. Torches were rarely used for
interior illumination, but are still extensively used in night fishing. (See p. 397.)

CONTAINERS

The Marquesans use a great variety of containers which may be divided 415
into two main classes: natural containers, such as bamboos, coconut shells and [314]
gourds, which need little preparation for use; and wooden containers, which require considerable skill in manufacture. The wooden containers are by far the more important in the Marquesas and are well represented in most museum collections.

NATURAL CONTAINERS

JOINTS OF BAMBOO

The Marquesans, like all peoples living in regions where the larger species of bamboo grow, used joints of bamboo to transport and store fluids. Small bottles, made from a single joint, do not appear to have been used, as their place was taken by more convenient utensils of gourd or coconut shell. Large bottles were made by cutting bamboo shoots three inches or more in diameter into sections from 10 to 20 feet long and piercing the septa between the joints, forming
a pipe closed at one end. The piercing is now done with an iron rod heated red; [322]
the ancient method could not be ascertained. When in use the upper end of the
tube was filled with a plug of green leaves. Bamboo bottles were purely utilitar- [531]
ian and were never decorated.

COCONUT SHELLS

The climate and soil of the Marquesas are ideally adapted for the growth of coconuts, the trees bearing profusely and producing nuts of remarkable size. It is not surprising, therefore, that the natives made an extensive use of coconut shells as containers and that they developed considerable skill in the manufacture and decoration of utensils of this kind.

The half shell of a coconut constituted a natural cup which could be used 415
without preparation. The first improvements upon this original form appear to
have been the smoothing of the edge by grinding and the removal, also by grinding, 322
of the small external point which prevented the cup from standing upright.
Cups and bowls made in this way are still occasionally used. The next step is
to remove the tough inner skin and rub the outer surface smooth; rubbing-
stones and burnishers are used for this work. As a final improvement the cups
were either carved or ground thin. Carved cups were given a smooth finish and
then decorated by the same methods and with the same designs as wooden con-
tainers. To make the thin, uncarved cups both the outer and inner surfaces were
ground away until the walls were only slightly thicker than egg shell china. They
were then thoroughly impregnated with oil, making them elastic and capable of
withstanding quite heavy usage. When first finished, the surfaces of coconut 415

415 cups were rather dull, but with handling they acquired a beautiful glossy polish. Many cups were provided with a cord handle by which they were hung up when not in use. This handle consisted of a loop of sennit passed through a hole a short distance below the rim, the inner end being kept from slipping back either by a knot or by a small disk of pearl shell, like a button. (See Pl. LVIII, *A*, 1.) The finer grade of cups were used principally in kava drinking, which gave the inner surface of the cup a coating of glossy yellow enamel, like lacquer.

It is difficult to draw any line between cups proper and bowls, as the two classes grade imperceptibly into each other. As a rule the bowls are larger and thicker walled, and most specimens have recurved rims, that is, they are made from more than half a nut. Most of these bowls are provided with handles by which they can be suspended horizontally. One specimen in the Bishop Museum has the handle cut in one piece with the body of the bowl (Pl. LVIII, *A*, 2), but as the bowl is evidently unused it seems doubtful whether this is an ancient form. The handles of old specimens are of cord and appear to conform to a single type. (See Pl. LVIII, *A*, 3.) They were made as follows:

A pair of holes were pierced through either side of the shell a short distance below the rim. A loop of sennit cord was passed through each pair of holes, the ends protruding on the outside. A large black seed was then threaded upon each end of the loop and pushed down against the outer surface of the utensil. A cylinder of human bone, carved with horizontal grooves, was next threaded on, followed by another seed. The two strands of cord were then brought together and passed through a short thick ornament cut from the shaft of a human humerous, carved into a tiki figure. Above this ornament both strands were threaded through a single black seed and closely wrapped with a strand of fine sennit, giving them the appearance of a single cord. The ends of the loops were either tied together above the center of the bowl or interwoven and enclosed in a continuous wrapping which concealed the point of juncture. Bowls arranged for suspension in this way were frequently provided with carved wooden covers like those used for gourds. Bowls were usually rougher in finish than cups and were rarely carved.

Coconut bottles were made from the whole nut, the kernel was removed by a simple but ingenious method. (See Pl. LVIII, *C*.)

825 A large ripe nut was husked and the shell around the largest eye ground away to form an aperture about one inch in diameter. The nut was then placed in some stream where fresh water shrimps were plentiful and was left for a few days. The shrimps, entering through the aperture, picked the interior of the shell clean and left it ready for use. One of the smaller eyes was then pierced with a pointed stick and a loop of heavy cord passed through and secured on the inside, the outer end of the loop serving as a handle for the bottle. A wooden stopper for the large aperture completed the utensil, which appears never to have been decorated.

A slightly different type of bottle was used for the storage of scented oil for the hair (Pl. LVIII, *B*).

These utensils were made from small, thick shelled nuts having a more or less pointed stem end, which was ground off to below the eyes. The kernel was removed by the method just described. Most bottles of this sort were elaborately carved, some of the specimens ranking among the finest products of the native art.

GOURDS

The Marquesans appear to have made a rather limited use of gourd containers. No gourd plants were seen growing, but from a comparison of the utensils collected with those in the Bishop Museum the species was probably *Lagenaria vulgaris*. According to informants, both necked bottles and neckless containers were formerly used, but all the specimens seen were neckless and were called by the natives *hue*. To make a *hue* the ripe gourd was plucked from the vine while still soft and the stem and adjacent shell cut away to form a round aperture three inches or more in diameter. The seeds and pulp were emptied out and the shell carefully dried in the shade. The interior was then scoured smooth with beach sand. Utensils of this sort appear never to have been decorated and ornamental shapes made by deforming the growing fruit had never been heard of by the informants questioned. All the *hue* seen were comparatively small, the largest being slightly under one foot in diameter, but the size of some of the wooden *hue* tops seen in burial caves would indicate that much larger utensils of this sort were formerly used. (See Pl. LVIII, *E*). 415 [824] [531]

When in use the *hue* was supported and protected by a network of cords similar in principle to the Hawaiian *koko* (net), but rather inferior in design and execution. The manufacture of these nets has been discontinued and only two specimens were seen in the group, both in Pua Ma'u, Hiva Oa. Both were made of coconut fiber cord. Ordinary sennit of the sort used for house lashings was used for one specimen, and for the other, a flat five strand plait. The form of the nets may be seen from the accompanying sketches. For *hue* No. 1, on Plate LVIII, *E*, the process of manufacture appears to have been as follows: 415 286

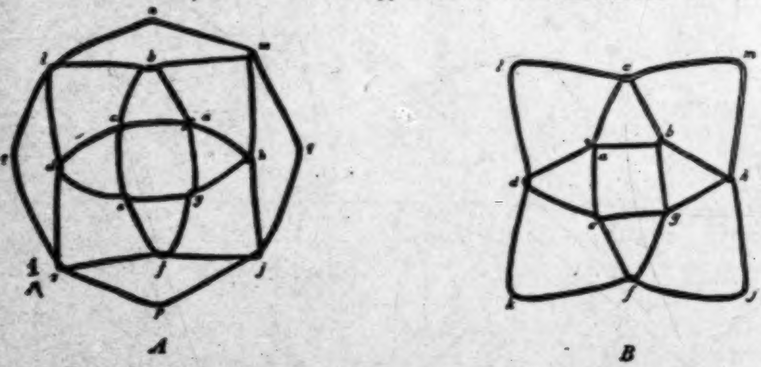

FIGURE 7.—Sketches of network of cords used to support gourd containers.

1/Λ [this should be k, in light of description on page 358—Analyst]

415 286 A large loop was first formed, one end of the cord being tied and left at *A*. (See fig. 7, *A*.) The loops *abc*, *cde*, and *efg* were then made in the order named. The direction was then reversed and the loops *ghjf*, *fkd*, and *dlb* formed. The direction was then again reversed and the loops *bmnl*, *lok*, *kpj*, and *jgm*[1] made. From *m* the cord was carried to *h* and thence to *a*, where it was knotted in beside its other end. The points *n*, *o*, *p* and *q* projected above the top of the *hue* and served for suspension. The dimensions of the different meshes are: *a* to *c*, 4⅗ inches; *a* to *b*, 4½ inches; *b* to *l*, 6¼ inches; *l* to *n*, 5 inches. The mesh, with the exception of the outermost loops, is drawn to scale. The knot employed is uniform except at the points *h* and *a*. It is a complicated wrap knot for which no name is known.

The net of *hue* No. 2 on the same plate, although superficially resembling that of *hue* No. 1, is made on an entirely different principle. (See fig. 7, *B*.)

The netting was not begun with a ring, the course of the cord being *a*, *b*, *c*, *a*, *d*, *e*, *f*, *g*, *h*, *j*, *f*, *k*, *d*, *l*, *c*, *l*, *h*, *b*, *g*, *e*, to *a*. Here the two ends are spliced together into a single cord of the size used throughout and tied about the line *cd*. A loop of cord was passed through the outermost meshes at *l*, *m*, *k* and *j*, to serve as a handle, its ends being tied together in a heavy knot. The mesh sizes are: *a* to *b*, 4¾ inches; *a* to *d*, 5 inches; *d* to *l*, 7⅓ inches. Two types of wrapped knots were used in different parts of the net.

[284]

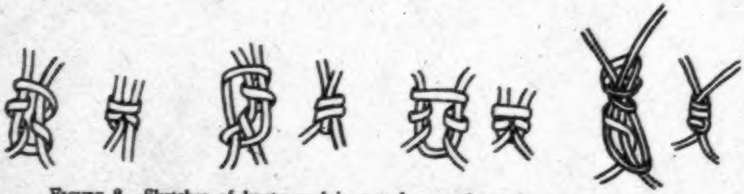

FIGURE 8.—Sketches of knots used in nets for gourd containers.

The widely divergent technique of the two specimens would seem to indicate a considerable variety for these objects in ancient times.

415 Gourd *hue* were normally provided with wooden covers, which were all made according to a fixed pattern. To one ignorant of its use such a cover would appear to be a small squat broad mouthed jar, with a rounded bottom, flatly convex to hemispherical body, a short neck whose sides sloped inward slightly toward the top, and a wide flat shoulder whose upper surface sloped inward and downward to the base of the neck. When used as a cover, the jar was inverted, the neck fitting into the orifice of the *hue*, the shoulder resting upon its top. The body of the cover rose above the *hue* as a small dome, and was frequently carved, [531] the decoration consisting of two tiki faces placed opposite each other. The space above and between these faces was filled with shallow parallel grooves running continuously from edge to edge. In spite of their form, *hue* tops appear never to have been used as separate containers, and they were probably hollowed only for the sake of lightness. (See Pl. LVIII, *F*.)

[1] [this should read jqm, in light [98] of illustration on page 357. —Analyst]

WOODEN CONTAINERS

The Marquesans made a great variety of wooden containers all of which 415 may be placed in one or the other of two main groups: boxes, and bowls or dishes. The objects of each of these classes show considerable individual variation, and in the case of covered containers it is often difficult to say whether a given specimen is a bowl or a box.

BOXES

Wooden boxes, used for the storage of valuables, formed part of the equipment of every well-to-do Marquesan family. Such boxes were hewn from large pieces of wood by the processes described under bowl manufacture. (See p. 360.) The favorite materials were breadfruit, temanu and *mio*. The boxes [824] varied greatly in size and in minor details of form and decoration, but all the specimens seen were clearly of a single type. They were made in two parts, a body and a lid. (See Pl. LIX, *A*.)

The body was oval in outline, with a more or less rounded bottom and considerably recurved sides; the upper edge was finished in a narrow flat rim which was broadened at either end. At one end of the body a large knob projected above the rim, while at the opposite end the body was either flattened or bore a short flat-ended horizontal projection. The lid was rounded on the outside, excavated inside, and bore along the inner edge of its rim a thin downward projecting flange which accurately fitted the orifice of the body. The end which rested against the knob of the body when the lid was in position was either flat or notched. The opposite end was elongated and provided on the under side with a short downward projection like a thick blunt hook, which rested against the outside of the body.

In one specimen, which differs in other details from the normal type, the rear end of the lid bears an upward projection corresponding to the knob of the 415 body. (See Pl. LIX, *B*.) In well made boxes the lid fits the body so closely 531 that it is frequently difficult to remove it. The whole utensil appears to be a more or less modified bird form, the body knob representing the head; the horizontal projection of the lid, the tail. (See Pl. LIX, *C*.) Boxes were frequently carved and the designs were usually the same as those used upon bowls. The first step apparently was to carve the body knob into a tiki face, and specimens in which this constitutes the sole decoration are not uncommon, although the more ornate examples are carved all over. In one crudely carved specimen in the Bishop Museum the designs show a preponderance of angular-geometric figures coupled with small line representations of human beings which are not of tiki type. (See Pl. LIX, *B*.)

BOWLS AND DISHES

Wooden bowls and dishes are probably more numerous in ethnological collections than any other objects of Marquesan manufacture, as the elaborate carvings with which many of them are decorated make them eagerly sought after by collectors. They still form part of the equipment of every native household 415

415 [322] and are manufactured in considerable numbers. No lathes have ever been introduced into the Marquesas, and all wooden utensils are still made by aboriginal processes modified only by the introduction of metal tools. The modern makers have ceased to reproduce the more elaborate ancient forms and ordinary utensils are rarely carved at the present time; but skillful carvers are still found in Nuka Hiva and Hiva Oa, and especially in Fatu Hiva, which was formerly the artistic center of the group.

415 824 The Marquesans employed a great variety of woods for their utensils, the favorite being *mio* (*Thespesia populnea*). This tree has a dark brown heart wood and white sap wood, while its softness and even texture make it especially easy to carve. Next in importance came the temanu. This wood is light red to yellow in color and somewhat harder and less even grained than the *mio*, but still well adapted to the purpose. The trees attain a very large size, and on this account temanu appears always to have been used in ancient times for feast bowls and other large vessels. Most modern utensils are made of this wood, as the supply of large *mio* is practically exhausted. *Mei* (breadfruit) was used to a limited extent, but was considered an inferior material. Fau wood, when taken from old trees, was occasionally used, and small more or less ornamental vessels were made from sandal wood or *toa*. *Toa* was especially difficult to work on account of its hardness and its tendency to split, and objects made from it seem to have been primarily intended to show the skill of the workman. A number of other woods were sometimes used for special purposes or in the absence of better material, but according to informants, *vai*, a close grained red wood which appears well adapted to bowl making, was never used because it would split when exposed to the sun.

415 322 Modern bowl makers shape their utensils with adzes and knives, but knives are little used. The adzes are provided with iron blades made either from plane irons or from sections of iron pipe, which has replaced the stone blades of the *toki kouma* type. (See p. 323.)

A well equipped workman employs a whole series of adzes of diminishing size, the last used being miniatures only a few inches in length. Green wood is used when possible, as it is softer and easier to work, but seasoned wood can also be used for bowls after it has been soaked in the river for several weeks. A block considerably larger than the intended object is first roughed out from the log, and is then worked down with the adz until the desired outline has been obtained. In all the examples seen approximately the final form was given to the exterior before the excavation of the interior was begun. In making round bowls a pair of European compasses are now used to outline the rim, but the shaping of the body is done entirely by eye. In shaping the exterior a light glancing blow is used, the chips detached being of such uniform size that a well made bowl just prior to polishing is covered with a multitude of small regular facets like those on a bowl of beaten brass. In excavating the interior the workman begins at the center, and gradually works back to the edges, hollowing the whole interior to the depth of about an inch. He then begins at the center once more and excavates another level, continuing until the desired depth is reached. The inside of an unfinished bowl that consists of a series of steps, each marking one of the layers of excavation, and the removal of these steps is the last process prior to the polishing. The workman usually sits upon the ground, with the bowl held on edge in front of him and steadied with the left hand. In hollowing the interior a double stroke is used for each chip, the first blow being made horizontally, the second vertically. The bowl is slightly turned after each double stroke, and the excavation kept as nearly circular as possible. A knife is ordinarily used to trim the rim, being held with the blade below the hand, edge outward, and pushed away from the operator. Bowls are shaped as far as possible with the adz and knife, the final polishing serving only to obliterate the tool marks. Polishing is done with sand paper, the finest grade obtainable being used for the last stage, but in ancient times coral grinding stones were used. When the bowl has been rubbed smooth the surface is burnished with a china door knob, applied with as much pressure as possible. Old pebble polishers which have acquired a glassy finish are still occasionally used. The modern workman seems to be fully as skillful as his poorly equipped ancestor, and unless some enterprising European introduces lathes into the group it seems probable that the primitive processes of manufacture will survive unchanged for many years. 415 322

The Marquesans relied almost entirely upon carving for ornamental effect, and from conversations with modern bowl makers and carvers it would seem that the natives have little appreciation of the beauty of the wood used or the aesthetic value of pure form. This is borne out by the fact that some elaborately carved specimens are noticeably asymmetrical, when the fault could have been remedied without injury to the utensil. It is certain that many shapes of utensils were formerly used, but the long European contact has resulted in the disappearance of many of these origina' types and probably in the introduction of new types. The following list of native terms for various types of bowls and dishes has been compiled by Handy from Dordillon's Dictionary: 415 531

[illegible]. A large oblong dish (pig white in the middle and black at the extremities). 415
[illegible]. Dish. 192
[illegible]. Kind of native dish.
[illegible]. Cover of calabash, operculum of shell
Kohipu. Covered vase for popoi.
[illegible]. Native dish. Bowl.
Kipu. Vase to serve kava. Popoi bowl with cover.
Kapu. Vase for kava.
Kaipu. All vases.
Ipu. Bowl. All vases of small dimensions.
Nau. All vases with large openings.
Nau [illegible]. Calabash.
Tipeei. Dish.
Tihoro, Tihorohoro. Small dish.
[illegible]. Drinking vase.
Tanoa. Vase to prepare kava.
[illegible]. Small dish.
[illegible]. Oblong dish.
[illegible]. Large dish for popoi.
Puru hue. Small dish.
Pihoro, Pihorohoro. Native dish.
[illegible]. Covered dish for popoi.
[illegible]. Large vase with cover to conserve popoi.
[illegible]. A round wooden dish. An oval dish with a cover.

Many of these container forms could no longer be identified, and the following descriptions are based on specimens seen or described by reliable informants. 415

415 Round wooden bowls (Pl. LIX, *F*) are still in use in all native households. The larger bowls are called *pora*, the smaller *ipo* or *tahake*.

In bowls of ordinary sizes the form is that of a segment of a sphere, but this is somewhat modified in the case of the large feast bowls, which are rarely over nine inches deep, although they may have a diameter of over four feet. Flat bottoms, meeting the sides at an angle, appear to be unknown. In most large and many small specimens the sides have a slight external recurve at the rim, and in practically all round bowls the greatest width of the interior is a short distance below the rim. The rims are flat and relatively wide, meeting the inner and outer surfaces of the body at sharp angles. In most bowls the rim is horizontal, but in some the inner edge is considerably higher than the outer.

At least two types of very deep circular bowls were used in ancient times.
415 One of these, called *kipo*, was used on the island of Nuku Hiva for *kava*. It was
764 about ten inches tall and eight inches in diameter, and is said to have been provided with a small flat base (Handy, personal correspondence). In Hiva Oa a
[824] large, very deep bowl of *toa* or *mio* wood was sometimes used in the burial caves as a container for the skull of a chief or beloved relative. The practice was rare, however, and the description is based upon a single specimen found some years ago in a burial place. The original bowl was not seen as its finder had used it as a container for his wife's skull, but according to natives who had handled it, it was elaborately carved and had the form of the deep Hawaiian *umeke* (8, *a*, p. 161 and fig. 142).

415 A description of a special type of small circular container, called *hue po'o* was obtained in Pua Ma'u, Hiva Oa, by Handy.

[266] This container was provided with a lid having a knob handle in which there was a cavity much like the sponge container of a modern humidor. Human flesh was packed into the cavity, and as it decayed the juice dripped down into the bowl below. The fluid was wiped out from time to time with green taro leaves and eaten as a delicacy. The object of the peculiar handle arrangement is said to have been to guard against the theft of the flesh. The container was provided with a long loop handle, probably like those used on coconut bowls, and was carried slung around the neck.

Many circular bowls were provided with fiber handles which were attached to one side and served for the suspension of the utensil when not in use. The simplest of these handles consisted of a loop of sennit passed through a hole below the rim of the bowl and held by a knot on the inside. In another simple form two holes were drilled, the loop being passed through both. The most characteristic handle attachment, which is still used on most well made bowls (Pl. LIX, D) is made as follows:

A hole is bored in the side of the vessel a short distance below the rim, care being taken not to pierce the inner wall. A second hole is then bored downward through the rim, meeting the first at right angles. A loop of cord, braided continuously or spliced at the ends, is then inserted in the lateral hole and fastened by a wooden plug driven downward through the vertical hole. The top of the plug is cut off flush with the rim. Handles of this sort were sometimes decorated by stringing upon the loop large seeds or pieces of carved bone.

One specimen was described as having a very short loop of cord passed through a large ring of carved bone, which served for suspension. In very large feast bowls the handle was made of a heavy plaited cord of coconut fiber whose ends were attached at two points, four to five inches apart. Such handles were usually encased in a series of bone tubes, made from the small bones of the lower arm or leg. These were similar to the tubes used on the cord handles of coconut shell bowls. The native name of these tubes was not ascertained but according to Handy (32) Dordillon gives a term, *tipao*, which he defines as "a piece of bone to ornament dishes or drums." It seems probable that this refers to the small carved figures rather than the simple corrugated rings, for the rings were not used on drums so far as could be learned. It is rather interesting that the large feast bowls had handles on the side only, indicating that the handles were used to suspend or drag them, not to carry them. 415 [531]

Wooden handles, cut in one piece with the bowl, are very rare in the circular forms—only three examples were found.

In one of these specimens there are four small, equally spaced projections a short distance below the rim. These projections are carved into peculiar little double figures, and as the rest of the bowl is uncarved the projections are probably intended for ornament, although they could have been used for handles.

Another bowl seen in a native household, had a flat handle about six inches long projecting from one side of the rim. The shape of this handle was identical with that of an ordinary American frying pan, and it seems probable that this development was due to European influence. Still another bowl (Pl. LIX, *E*) now in the Bishop Museum, is egg shaped rather than round. [177]

It is a rather deep well-made bowl, 9 inches wide and 10½ inches long to the base of the handle. The handle springs from one side of the rim and is 3⅛ inches long and an inch wide in the center. The outer end is expanded both laterally and vertically, and the tip has a deep vertical notch. The whole handle has very much the shape of the distal end of a human humerus, and may very well have been modeled after one.

It seems probable that covers were employed with some types of round bowl other than the *hue po'o* just described, but if so their use has been discontinued for many years and no examples have been preserved or described.

Some round bowls, especially those of recent manufacture, are provided with low circular bases. A similar feature is found in certain tureen-like oval forms (p. 365). Most of the natives believe that this feature is a recent innovation, copied from the Chinese rice bowls introduced by European traders. On the other hand, a very beautifully carved bowl in the possession of Mme. Mallius, of Ta'aoa, Hiva Oa, shows this feature, although it is obviously an old specimen. It seems probable, therefore, that if the circular base is non-Marquesan it was introduced during the early period of contact. [177]

The transition from round bowls to the oval and rectangular forms appears to be a gradual one, every step being represented by a few examples. No. 1 shown on Plate LX, *A*, is especially interesting in this connection as it has all the features of an ordinary round bowl except that the rim is slightly flattened on

415 all four sides. Square utensils appear to have been unknown, those which were not round being oval or oblong. In most of the oblong specimens the sides are more or less convex, the difference between them and the oval forms lying in the degree of flattening at the ends.

Two specimens of a very curious oblong type not observed elsewhere were seen in the Valley of Hanapaoa, Hiva Oa. These utensils were flat bottomed, with shallowly convex sides and ends which met in well marked angles. The [171] whole form bore a remarkable resemblance to the type of food dish commonest among the Haida of the Northwest Coast of North America. The utensils were evidently of recent manufacture and the natives could give no name for the type and were uncertain whether it was ancient.

Oblong trays and dishes appear to have been in rather common use in ancient times, although few specimens have survived. Those seen were provided with low vertical sides and almost flat interior bottoms. The exterior was smoothly rounded. The troughs for beating *popoi* are really very large oblong trays (p. 352).

Several well marked types of oval dishes may be distinguished, of which the long narrow flat ended containers, called *toto*, are the most important. Except for the proportions of the different parts and the inward curve of the sides toward the rim, the form of these utensils is almost identical with that of the underbodies of the large built up canoes. The ends of the vessel are straight, the sides convex, so that the greatest width is in the center. The sides also show a vertical convexity, and the maximum width of the utensil both internally and externally is about midway between the bottom and rim. (See Pl. LX, *B*.)

Most of the *toto* are large. Bowls long enough for a man to lie in are remembered by the older natives. The smallest example seen was 18 inches long, with a maximum central width of 8⅝ inches. Usually no handles were used with this type, but this small specimen was provided with a handle consisting of two loops of sennit passed through holes bored vertically in the corners and tied together above the center.

[482] *Toto* are said to have been used principally for the transportation of prepared food at the time of feasts, and according to natives their shape was designed to make them easier to carry upon the shoulders. They were carried transversely, resting upon both shoulders and the nape of the neck, the bearer's head being bowed upon his chest.

Small oval *kava* bowls, with nearly parallel sides and rounded or pointed ends appear to have been fairly common and probably constitute a distinct type. Some of these bowls were provided with a suspension loop or handle attached to the center of one side. (See Pl. LX, *A*, 2-3.)

415 Oval dishes and trays are now obsolete, but seem formerly to have been rather common. They were of all sizes; examples as much as five feet in length are remembered. Smoothly rounded inside and out, they had no distinct sides. Some specimens showed a distinct flat rim. In a large specimen of this type in the Bishop Museum one end of the rim bears a short upward projection cut into two levels, like steps, but as no examples of this were seen in the group its purpose was not ascertained. (See Pl. LX, *C*.)

[531] Stewart (59, pp. 331-332) speaks of a large trough "rudely sculptured at one end into a head gaping hideously, as if to devour all who approach," which he saw in a *me'ae* of Nuka Hiva. At the time of his visit it contained a decaying human sacrifice. Very large oval bowls with tight fitting covers are also mentioned by early visitors, but no examples appear to have survived.

415 531 Small oval bowls having at one end a projecting neck terminating in a knob, and at the other a flat tipped projecting tail flush with the rim, appear to have been rather common in ancient times. In one specimen of this type (Pl. LXI, *B*, 1) which was found in a burial cave and is probably pre-European, the knob is carved into a fine tiki head, directed forward and slightly upward, and the lower side of the neck is encircled by a row of small perforations which were probably intended for the attachment of hair or feather ornaments. In another specimen (No. 2 in the same illustration), also old, the outer end of the knob is pointed and its upper surface is carved into a legless tiki whose face is nearly horizontal. This specimen has on either side a short distance below the rim, a horizontal flange, the whole form being obviously a modification of a bird effigy. Two holes for the attachment of cords are drilled near the tips of the knob and of the tail. The relation between the bowls of this type and the bodies of the boxes (p. 359) is evident, and it is difficult to determine to which class some specimens belong.

The collections of the American Museum of Natural History, New York City, contain an elaborately carved bowl having at either end a flat projecting handle. A similar specimen with the handles carved into grotesque heads is figured by Christian (10, p. 148). Both specimens are obviously recent work, probably made for sale. There is no reason to suppose, however, that they were copied from any European form, a point of importance in our consideration of the next type.

415 177 Marquesan utensils having an oval body, a low round base placed centrally, and a projecting knob handle at either end, are quite common in collections (Pl. LXI, *A*). They are frequently provided with a domed cover having upon its center a knob handle, and are always elaborately carved. The resemblance of many of these utensils to European soup tureens is striking, and old

415 177 European residents of the group and many natives believe that they were copied from them. Other natives declare that the form is ancient. In view of the containers mentioned in the preceding paragraph it seems most probable that this type has been developed from an aboriginal one by the addition of a base and that the obvious resemblance of the resulting utensil to a soup tureen has given rise to the belief that the European utensil was copied entire. The question of the occurrence or non-occurrence of a base in primitive Marquesan utensils is of considerable ethnological interest, but the native evidence is conflicting and very few really old utensils have been preserved. In view of the practical absence of this feature elsewhere in Polynesia it seems safest to ascribe it to European influence.

415 Legged containers appear to be entirely absent in the Marquesas, the nearest approach being a low transverse flange carved near either end of the bottom. This feature was observed in only one specimen, and there is good reason to believe that it was not aboriginal. In view of the importance of utensils with legs in the Society Islands and their occasional occurrence in Hawaii, their absence in the Marquesas is rather curious.

Two bowls of unusual form are shown on Plate LXI, *C*. No. 1 seems to be an imitation of a long cupped leaf, the short upturned handle representing the stem. In both specimens there is a deep channel at the smaller end evidently intended to direct the flow of the fluid in pouring. In No. 1 this channel ends in a well marked lip. The interior of No. 2 is coated with *kava* enamel and it is probable that both were used as *kava* bowls.

An end channel similar to that in No. 2 is a common feature of the large four-legged Tahitian bowls, while bowls with lips were occasionally made by the Maori. Elsewhere in Polynesia these features appear to be rare or lacking.

COMPARISON OF CONTAINERS

415 171 A comparison of Polynesian containers could not fail to throw a great deal of light on the relations of the different groups, but anything like a satisfactory study is impossible at present. Regions in which the containers are poorly made or undecorated are often entirely unrepresented in Museums, while many others are represented by two or three specimens at most. Under the circumstances it is only possible to point out a few obvious similarities and differences. Long oval boxes with covers were numerous in the Marquesas and New Zealand, but appear to have been unknown in Hawaii and Western Polynesia. Round boxes with tight fitting covers are found throughout Western Polynesia and in Hawaii, but are lacking in the Marquesas and New Zealand. They appear to have been rare in Hawaii, and it seems safe to assign the long

box to the marginal, and the round box to the western culture. Vessels with legs 415
are common in Western Polynesia and in the Society Islands, but are rare in
Hawaii. They are absent in the Marquesas, and the only utensils which approach 171
this form in New Zealand are certain large gourds used for potting birds which, according to Tregear (82, p. 98), were fitted with three or four legs to make them stand upright. It is probable, therefore, that the use of legs cut in one piece with the utensil was a feature of the western culture, their absence a feature of the eastern.

A comparison of Marquesan and Micronesian containers yields some interesting results. The Micronesian containers are uniformly flat bottomed and many are provided with bases. The Marquesan containers are round bottomed and the aboriginal use of a base is questionable. The bases of modern utensils appear identical with those used in the Pelew group. (Kubary, 76, Plates 23-7.) Bird shaped containers similar to those of the Marquesas were used in Pelew and the Caroline Islands. (See Finsch, 73, p 321, and Wilson, 83, p. 102.) These bird forms are not found in any other part of Polynesia or Micronesia.

Melanesian containers have never been studied or described as a whole, but it seems certain that the long oval box, which is a feature of eastern Polynesian culture, does not occur in this region. Legged utensils on the other hand are rather common, being most numerous in the Solomon Islands and in Fiji. Bases similar to those of the Pelew and Marquesas Islands seem to have been rather common in the Solomon Islands.

DECORATION OF CONTAINERS

Marquesan containers were decorated by several methods of which carv- 415
ing was the most important. The handles were decorated with seeds and bone 415
tubes, and feathers or locks of hair seem to have been attached to the bodies of 531
some of the containers. The lids of some bowls were covered with an incrustation of red or black seeds imbedded in breadfruit gum. Single red seeds, applied here and there, were used to heighten the effect of the carving, especially when the container was made of the dark colored *mio* wood. These seeds were either wedged in deep grooves of the carving or partly imbedded in the wood. This imbedding of seeds is an approach to inlaying, but it is significant that in spite of the strong aesthetic sense of the Marquesans and their extensive use of bone and mother of pearl in personal ornaments, they appear never to have inlaid wood with these materials.

The elaborate carved decoration of many Marquesan containers made them much sought after by collectors, and the demand for objects of this sort has led to a persistence of the art, although in a rather decadent form. In pre-

In pre-
415 European times the carving was done with sharks' teeth, rats' teeth, or shells, but
for nearly a century these implements have been replaced by implements of iron.
531 Practically all the tools now used by carvers are home-made and are crude, but
322 effective. They consist of small chisels, made from large nails ground to a straight edge; curved chisels, also made from nails, and small gouges, which are usually made from umbrella ribs. Knives are apparently never used for carving.

Containers are always completely shaped and polished as if for use before carving, a practise which increases the difficulties of the artist as it makes it impossible to conceal any slips of the chisel. The bowl to be carved is soaked in a stream for some time to soften the wood, and when not being worked on is usually kept in water. Only beginners draw the designs upon the utensil before carving; the skilled workman carves entirely free hand and arranges the spacing of even the most intricate designs entirely by eye. The chisel, usually fixed in a rough wooden handle, is held with the bit below the hand, and the carver appears to work with equal facility either toward or away from the body. The incision is first marked out by pressing the chisel into the wood vertically, and is then made by pushing the tool along horizontally, with one corner of the bit at the bottom of the original vertical cut and the edge, sloping upward to the surface of the bowl at a variable angle. A long triangular sliver is thus removed; any irregularities in the cutting are dressed down with small chisels. In a very large proportion of the carved specimens all the incisions have this triangular form, but when wide spaces are to be cut away they are outlined by two cuts of the sort just described, the wood between is removed, and the bottom of the space dressed flat or left with a low central ridge. Curved chisels are used to dress the vertical sides of incisions in curved designs, while the gouges are used principally for small details or shallow designs which are incised rather than carved.

Modern carvers have a strong tendency to enlarge and simplify the details of the designs and broaden the incisions in order to increase the speed of production.

415 Carved decoration appears to have been most commonly used upon round bowls, next in frequency being the boxes and the tureen-like covered dishes. At
531 least some of the other forms were probably carved in pre-European times but no carved *toto* or oval bowls, with the exception of the bird effigies, are known. Bird effigies and some boxes were carved only upon the projecting knob, and a few bowls and dishes were decorated with a carved band below the rim, but as a rule the carving covered the entire outside of the utensil. In applying the designs the surface was rarely, if ever, treated as a whole, being broken up into a number of sections which were treated as separate units. In the actual process of carving the outlining of these sections upon the bowl was the first step, and the filling designs were applied afterward. A symmetrical arrangement of the sections appears to have always been intended, and there is usually more or less agreement between the filling designs of corresponding sections. In decorating a circular bowl the bottom was usually treated as a single unit, although it was sometimes divided into two or more parts. The sides were divided either into horizontal zones or vertical sections, and the boundaries marked either by plain

grooves or by narrow bands of design. On account of the shape of the vessel the vertical sections were wider at the top than at the bottom. Some specimens show both horizontal and vertical divisions. On boxes and other oval containers the arrangement of the sections appears to have been variable. 415 531

CLASSIFICATION OF DESIGNS

The material available for a study of container designs is limited. Only one of the carved containers studied appears to belong to other than the later period of European contact, and the bulk of the specimens in museums are unquestionably commercial products. Most of the modern work indicates a sacrifice of quality to quantity of production, which shows itself in slipshod work, simplification of the designs used, and an increasing tendency toward angularity. Each of the modern carvers has a tendency to ignore all but a few motifs, which he has learned to reproduce rapidly and accurately. As a result of this the work of a given carver, or that of his pupils, can at once be distinguished in a mixed collection. The style of many of the older specimens seems to indicate that a similar individual specialization in designs existed at least thirty or forty years ago, but it is impossible to say definitely that such was the case. It is probable that distinct local or individual schools of decoration existed in pre-European times; but if so, their content and differences can not now be established. The modern carvers appear to have borrowed few, if any, European motifs, and the present art is a simplified rather than a mixed one.

The simple division of designs into angular-geometric and curvilinear, used in the study of house post decorations, is unsatisfactory for containers. The best classification appears to be as follows: (*1*) band decorations, (*2*) angular-geometric designs used to fill sections, (*3*) design elements, (*4*) motifs, (*5*) representations of natural objects.

(1) BAND DECORATIONS

Band decorations consist of various arrangements of dots, straight lines and angles, with one arrangement of spirals, employed upon the spaces separating sections of design, and to some extent upon design elements. Bands appear rarely, if ever, to have been used to fill sections. Band designs are shown on Plate LXII as follows:

A. Straight parallel lines.
B. Straight rows of dots, used either singly or in parallel.
C. Parallel diagonal lines.
D. Herringbone patterns.
E. Cross-hatching.
F. Zigzag parallel lines, either longitudinal or transverse.
G and *H.* Alternate interlocking triangles, solid or filled with V's or with lines parallel to one side.

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- *J.* Alternate interlocking triangles separated by parallel diagonal lines.
- *K.* Two rows of opposed triangles, the spaces between being filled with concentric diamonds or broken scrolls.
- *L.* Bands of oblongs placed transversely at intervals equal to their width.
- *M.* A combination of *L* with a row of inverted triangles, the apex of each triangle resting against the end of an oblong.
- *N.* A combination of *L* with a zigzag line, apparently a modification of *M*.
- *O.* Rows of pointed half ovals, each oval containing a spiral.

(2) ANGULAR-GEOMETRIC DESIGNS USED TO FILL SECTIONS

Angular-geometric designs were rarely used to fill sections. The collection included only two specimens decorated in this way. One of these is a large feast bowl from Pua Ma'u, Hiva Oa, decorated entirely with simple angular-geometric designs, most of which are like those used upon house posts. The other is a crudely carved box, locality unknown, which bears very few designs of ordinary container type. The designs used are shown on Plate XLII, *P*.

1. Four triangles meeting at the apex, their interiors being filled with V's.
2. Groups of diamonds filled with concentric diamonds or angular scrolls.

(3) DESIGN ELEMENTS

The designs here described (Pl. LXIII, *A*), although sometimes enlarged to fill entire sections, were usually incorporated into complex motifs or used to fill in the parts of a section not covered by the main motif.

A. Spirals are the commonest element of Marquesan bowl design. Both single and double spirals are employed. A few examples are true spirals of nearly circular outline. Some are triangular but the greatest number are rectangular. The double spirals appear in several forms with the turns both in the same and opposite directions. (Drawings 1-5.)

B. Circles appear to have been normally used only to outline the section of decoration covering the bottom of round bowls. Only one example of a series of concentric circle used to fill a section was found. (Drawing 6.)

C. Ovals and rectangles grade imperceptibly into each other and it is often difficult to distinguish one from the other. Both were employed either as fill, or in enlarged form, to decorate entire sections. The interiors of these figures were usually filled with concentric ovals or rectangles. (Drawings 7 and 9.)

D. Pointed ovals were ordinarily used only as parts of more complex motifs and were less common than the ovals of class 7. They were filled either with concentric ovals or with herringbone patterns. (Drawing 8.)

E. Segments of ovals were extensively employed as fill and as portions of more elaborate motifs. They were usually filled with either concentric half or quarter ovals or with hooks. (Drawings 10-12.)

F. Combs, half ovals or half rectangles whose interiors were filled with short parallel lines perpendicular to the long axis of the figure, were employed principally as details of larger motifs. (Drawings 13 and 14.)

G. Pokaa is the name given a small circle, oval or rectangle broken at some point in its circumference. In the container designs *pokaa* figures grade imperceptibly into small circles bisected by a groove or bar, and from these into various forms of double spiral and scroll. The term is used here to include all figures of this class not certainly spirals or scrolls although its native application is probably more limited. The extent of the variation can be seen from the accompanying plate taken from those used upon commercial clubs. The *pokaa* was used to a minor degree upon bowls, and is fairly common in modern carving, but appears to have been primarily a tattooing design. It was also used on ancient war clubs. Arrangements of two *pokaa* placed back to back and joined by a bar do not appear to have been used in tattooing, but are found in the carving. (See drawings 15 to 20.)

H. The natives designate a series of concentric circles, ovals or rectangles broken by a bar or groove extending from the center to beyond the rim as *cipuoto.* These figures grade into *pokaa* and the two motifs are closely related. They are of only minor importance upon bowls, but appear in tattooing, upon house posts, and as petroglyphs. From their use in rock carvings it seems probable that these designs have a special significance, being possibly a conventionalized representation of a vagina and phallus. (See drawings 21-27.)

I. The use of hooks of characteristic form does much to give Marquesan art its distinctive quality. These hooks are of two types: One hook has a short vertical and a long horizontal arm meeting at right angles. The sides of the vertical arm are parallel; the lower side of the horizontal arm is straight and the upper irregularly convex. The end of the horizontal end is pointed. (See drawing 28.) The second hook contains either two or three sections which meet approximately at right angles, the sides being parallel throughout and the ends straight or rounded. (See drawing 29.) The pointed hooks are rare in container decoration, but are common in tattooing. The other type of hook is constantly used in container design, ranking even before the spiral in frequency. It is used principally to fill segments of ovals or rectangles, and the arrangement is more or less stereotyped. In filling a half oval a series of three section hooks are placed with their bases resting upon the straight edge of the figure and their points at alternate ends. The innermost hooks are usually of two sections only. (See drawing 30.) In filling a quarter oval two sections are employed, the bases of alternate hooks resting against first one and then the other of the straight sides of the segment. (See drawing 31.) The hooks are always incised and the raised surface left between the cuts forms a continuous scroll which will be referred to as a hook scroll.

J. Crosses. Both plain (drawing 32) and staggered (drawing 33) crosses were employed, but always in connection with other designs which filled the spaces between their arms and the edges of the section.

K. Triangles rarely appear outside of the band decorations. They are used principally upon the bottoms of bowls and are filled either with angular spirals or with concentric triangles (drawing 34).

(4) MOTIFS

Motifs include the various standardiation combinations of design elements other than those which appear to be representations of natural objects. These are illustrated in Plate LXIII, *B* as follows:

1. Crosses, either plain or staggered, with arms continued into hook scrolls which fill the four quarters of the section.

2. *Kaake,* broad, straight-ended elbow figures with ends and bodies decorated with designs. (The *kaake* motif is common in tattooing, but rare in container decoration.)

3. *Mata.* The simplest form of the *mata* consists of two half ovals (convex side downward) each of which is filled with hooks or concentric half ovals, below which centrally there is some variant of the *pokaa.* The space on either side of the *pokaa,* below the half ovals, is usually filled with small designs not connected with these main elements. The whole arrangement apparently represents a highly conventionalized face in which the half ovals serve as eyes and the *pokaa* as nose. Some forms of double spiral seem to be related to the *mata* motif. *Mata* are rather rare in container decoration, but are common in tattooing.

(5) REPRESENTATIONS OF NATURAL OBJECTS

415 The Marquesans appear rarely to have carved representations of natural objects other than human beings upon their containers, although a statement of 5-2 Langsdorff that they carved upon their bowls "little figures of human faces, of fish and of birds" (38, p. 172) may indicate that this was done in former times. The representations of natural objects upon the containers examined may all be assigned to some one of three classes: representations of human beings, representations of animals or insects, floral designs. With the exception of the human figures carved upon one box, all such representations are highly conventionalized and are linked by intermediate forms to various purely decorative designs.

(6) REPRESENTATIONS OF HUMAN BEINGS

The decorations on Plate LXIV, *A* may be divided into three classes: more or less naturalistic figures, which occur only upon the specimen mentioned in the preceding paragraph; angular-geometric figures; and figures carved according to the tiki convention.

The naturalistic figures (drawings No. 1) are crudely executed, resembling the drawings made by a child. The persons are represented with the legs apart and the arms akimbo. The body and limbs are shown as simple lines or bands. In one example the toes are indicated. The heads are disproportionately large and the features, when shown, are grotesque. Curiously enough the faces have little or no resemblance to those of figures of the tiki type.

Angular-geometric representations of human beings appear to have been employed exclusively in the form of narrow bands (drawing No. 2) The representations consist of an inverted triangle, representing the head, below which there is a cross line for the shoulders, with three vertical lines, representing the body and arms. No other features are indicated. Representations of this sort sometimes occur in the same bands with decorations *L*, *M* and *N*, shown on Plate LXII, and it is possible that those band decorations originated from representations of human figures.

Human figures carved in the round or in relief appear to have been almost never used upon containers; but flat figures, which stand to the true tikis in the relation of a line drawing to a bas-relief or statue, were extensively employed. They evince a strong tendency to modify the body by substituting decorative elements for its various parts, or to eliminate the body altogether. The convention used for depicting the features was essentially the same as that of the true tikis, and a suggestion of the relief form is usually retained in the modeling of the eyes within and above the rings. (Drawings No. 3.)

The eyes are shown by two rings joined at the inner ends and continued at the outer ends into horizontal bars which terminate in double spirals or scrolls, representing the ear. The

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bridge of the nose is usually indicated by a straight line, and the nostrils by semi-circles or semi-ovals. The mouth is shown as a simple oblong or narrow oval with a longitudinal central ridge, and in a few designs the teeth are indicated by short transverse grooves. There is usually a horizontal ridge across the eye ball, but in some figures the eye ball is smoothly rounded and in one specimen there is a distinct central disk, like a pupil. The most interesting feature in connection with the use of tiki figures is the gradual elimination of details. Not only is there a strong tendency to omit the body, but the features of the face are discarded one by one. The first to be lost is the mouth, followed, with equal frequency by the nose or ears. In a few carvings only the linked ovals of the eyes remain, and in some designs a single unmistakable tiki eye, with an attached ear, is used as a separate element.

(7) REPRESENTATIONS OF ANIMALS OR INSECTS

Three motifs appear to be highly conventionalized representations of some animal or insect. (Pl. LXIV, *B.*) Two of these motifs each occur upon one specimen only, while the third, with many modifications and variations, plays an important part in bowl design.

The simpler of the rare motifs (drawing No. 1), found in only one specimen, consists of a broad straight groove ending in a circle or semi-circle and having along either edge a fringe of diagonal lines. The whole form suggests a centipede, but it can not even be said with certainty that a representation of a natural object is intended.

A second rare motif, also found upon one specimen only, has a long narrow body in the form of a pointed oval, at one extremity of which are placed forelegs and a head and at the other hind legs with a suggestion of a tail.

The body is decorated with a single longitudinal groove and has on either side a number of short transverse grooves, apparently representing a spine and ribs (drawing No. 2). Each pair of legs, with the head or tail, is treated practically as a separate unit, the form suggesting the crosses shown in Plate LXIII, *B*, 1. The space along either side of the body is filled in the original with unassociated designs carved at a lower level. The whole treatment is so conventional that identification is difficult, but it seems probable that a lizard is intended.

The third motif is comparatively common in the modern commercial work from Fatu Hiva and shows a more or less standard form, with many examples which have been modified in various ways. The standard figure and various modifications are shown on Plate LXIV, *B*, 3.

The standard figure consists of a long oval with which are connected three pairs of spirals, two being attached at either end and the third pair somewhere along the sides. There is usually a suggestion of a head at one or both ends.

A more or less standardized variation, which may have been originally a separate motif (Pl. LXIV, *B*, 4) has a shorter and broader oval body, with or without a head, from the upper end of which spring two broad curved bands, while to the lower end are connected two spirals or separate scrolls. This form grades imperceptibly into purely decorative designs with no suggestion of representation.

FLORAL DESIGNS

415 532 Representations of plant forms are quite rare, and true floral designs are represented by only three examples. In two of these, which appear upon the bottoms of two bowls so closely similar in other details that they are probably the work of the same artist, the center of the flower is represented by two concentric circles, around which the petals, represented by small ovals, are placed radially. The interior of some of the petals is decorated with herring-bone design. (See fig. 9, *a*.) Upon a third specimen, groups of small pointed ovals, apparently representing bunches of leaves, are used to fill in the details of one of the larger designs. (See fig. 9, *b*.)

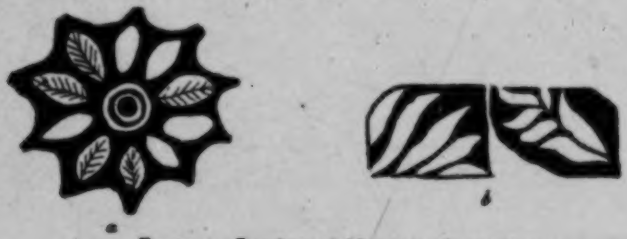

FIGURE 9.—Drawings of Marquesan floral designs.

415 531 From the specimens examined it seems that angular-geometric designs played a very minor part upon most containers, but they appear on a few specimens to the practical exclusion of curvilinear designs. Specimens showing anything like an equal frequency of occurrence of the two types of design appear to be entirely lacking. At the same time there is a strong tendency to give an angular form to designs which are basicly curvilinear. This tendency is most pronounced in the new specimens. The commonest of all design elements appear to have been the spiral and the hook scroll, segments of concentric ovals or rectangles ranking next in importance. Tiki figures, representations of animals or insects and combinations of crosses and hook scrolls are the most important motifs, as distinguished from design elements. *Mata* and *kaake* are rare, while *pokaa* and *eipuoto* are not common.

COMPARISON OF POLYNESIAN CONTAINER DESIGNS

415 531 171 Containers decorated with carved designs appear to have been unknown in western Polynesia and Hawaii. In other regions, except Easter Island and Chatham Islands, they were used to a greater or less extent, but reached their highest

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* The relation of Marquesan designs as a whole to those of other parts of Polynesia have been discussed fully in a paper by Ruth Greiner (77). Only the most important points will be summarized here.

development in the Marquesas. A superficial study of the designs employed in 415
the regions of their occurrence shows the following:

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In southeastern Polynesia, to judge from the few examples available for study, we have a division of the surface to be decorated into a number of small sections or bands which are filled with small angular geometric motifs. These motifs are usually applied in bands, and are not as a rule combined to form larger designs. The only curvilinear form is the concentric circle.

In the Marquesas we have a division of the surface to be decorated into sections of relatively large size which are often separated by bands of simple design. These sections are treated as units, being filled with large designs formed by the combination of several design elements. Both curvilinear and angular-geometric designs are employed, but curvilinear designs are clearly dominant in container decoration. There is a tendency to give angularity to basicly curvilinear forms, such as the spiral, but there is an equally strong tendency to round the angles of basicly angular forms, such as the oblong.

In northern New Zealand the surface to be decorated is either treated as a whole, or divided into a very few large sections by bands of narrow design. Only curvilinear designs are employed, the dominant motif being the spiral. An important feature of the technique is the use of a beaded interline.

If we compare the southeastern Polynesian carvings with those on western Polynesian weapons, the most elaborately carved objects from that region, we are at once struck by a basic similarity in design and execution. There is the same division of the surface into many bands or sections which are filled with small angular-geometric motifs. The southeastern Polynesian examples show an additional motif, the concentric circle, and show superior workmanship, but the carvings from both regions resemble each other much more closely than they do those of either the Marquesans or Maoris.

The Marquesan and Maori carvings have little superficial resemblance, but they possess two features in common which are foreign to the regions just compared; a predominance of curvilinear designs, and an extensive use of the spiral. The toothed line, important in New Zealand, occurs in the Marquesas but is rare there. The practise of dividing the surface to be decorated into sections, constant in the Marquesas, is rare among the northern Maori, but angular-geometric designs seem to have been used in carving in some parts of New Zealand.

It appears that there existed originally in marginal Polynesia, exclusive of Hawaii, a predominantly curvilinear art which treated surfaces as a whole or in large sections. The original western Polynesian art was angular-geometric, with a division of the surfaces treated into many small sections. In the Cook Islands, Austral Islands and Society Islands, the original marginal art was almost de-

415 531 171 stroyed by an invasion of western culture. The strong evidences of such an invasion have already been pointed out in the case of other elements of material culture. On the side of pure decoration the original art modified that of the invaders to a very small degree. Northern New Zealand, because of its location, was practically unaffected by the western Polynesian art. The Marquesas, on the other hand, received a moderately strong influence resulting either in the introduction of sectional treatment of surfaces and angular-geometric designs on or in the strengthening of these features if they were present in the original complex.

FIBER AND CORDAGE

283 [824] The material most commonly used for Marquesan cordage appears to have been the bark of the fau tree. The bark was obtained from young shoots two inches or less in diameter and was prepared as follows: The stripped bark was soaked for several days in a taro patch or in the backwater of a stream, left until the membrane connecting the inner and outer bark had been destroyed and the outer layer had begun to decay. The inner bark was then separated, scraped, and soaked for two or three days in fresh running water. It was then spread out and dried in the sun. Almost every native household has a bundle of this dried bark, strips of which are used for all the purposes for which Europeans employ string.

True cordage was made from the dried bark by either twisting or plaiting. Heavy rope was twisted from two or usually three strands. In manufacture the direction of rotation was the same as in European rope. In order to make the rope smooth and of uniform diameter, the bark was cut in lengths of two or three feet which were worked in gradually as the twisting progressed. The finished product was somewhat softer and more flexible than a hemp rope and when new was almost equally strong, but it did not wear as well as hemp. Twisted bark rope is still manufactured to a limited extent. The heaviest made is about one inch in diameter. In ancient times much larger ropes were made, but no examples seem to have survived. Light cords and small strings were made by rolling the bark on the thigh.

Small ropes and heavy cords were usually plaited, the bark being prepared as in rope twisting except that it was not cut into short lengths.

The strands were first loosely knotted together and held by the toes until enough cord had been braided to permit of attachment to a tree or post. The plaiting was then done in the ordinary European direction, that is, toward the workman. In cords ending in a flat loop the body of the cord was frequently twisted and the loop plaited. Three, four, six, seven, and eight strand plaits were used, but only the three and four strand plaits, called respectively *tona* and *fefii*, were used for ordinary cordage.

Rope of seven strands was used for certain ceremonial purposes (32). The six and eight strand plaits form flat bands, and are still used for the leg ends [231] of pig tethers. (See Pl. LXV, *A*.) Although most of the natives are familiar with these techniques, none of the informants questioned were able to give a name for them.

Practically all fau bark cordage was utilitarian, although slender black cord of this material was used with other material in a few ornaments. In the [292] feather headdress (*paekua*) it was plaited with tapa cord to form a black and white edging. The cords of the large fish net (*upena*) were dyed red with earth

283 The cords of the large fish net (upena) were dyed red with earth [386] called *ha'ace* which was worked into them in the course of the rolling, but apparently there was no decorative intent. Colors other than red and black do not seem to have been used. The method in dyeing the cord black was not ascertained, but it was probably the same as that used in dyeing sennit black.

[824] Next to the fau bark the material in most common use is coconut fiber. This fiber is of two kinds, that from the husk, which is short and rather stiff, and that from the leaf sheath, which is longer and more flexible, but lacks the strength of the husk fiber. Husk fiber is used for all ordinary cordage and is obtained by beating fresh moist coconut husks with stones until the tissues have been crushed and the fibers can be separated by hand. In the leaf sheath the fibers are arranged in thin layers which can easily be separated with the [227] fingers. Sheath fiber is said to have been employed for the large nets used in turtle fishing, and for the lashings of some chiefs' houses and sacred structures. It was also occasionally used for the thin cord employed in *pavahina* and as [534] strings for musical bows.

The heavier grades of coconut fiber cord are usually plaited, but the smallest cord is twisted from two strands while a somewhat heavier twisted cord, in a single strand, is used in one form of ornamental plaiting. Ordinary cord (Pl. LXV, *D* 1) was made by plaiting three untwisted strands of fiber, additional fibers being worked in as the plaiting progressed to keep the strands of uniform size.

The plaiter seated himself and, holding the end of the cord with his toes, plaited upward and away from the body. The ornamental cords used for *hue* nets and drum lashings were plaited from many strands—five, six, eight, and from nine to fifteen inclusive. They appear to have been always in the form of flat ribbons, and it is rather curious that no square four-strand coconut fiber plaits were seen although this technique was employed for some bark ropes.

Two forms of plaiting were used, one of which gave a broad thin band having the appearance of twilled fabric (Pl. LXV, *D*, 3), while in the other the strands ran in diagonally to the center of the band, where they passed alternately over and under (Pl. LXV, *D*, 2). The ends of cords made by the first technique were usually finished by short sections made by the second. In large cords made by the second technique two longitudinal strands of twisted fiber were usually used as a base, the strands of the plait passing alternately over and under these in a sort of figure eight motion. In well made cords of this type the base strands were completely covered, and the finished product gave the effect of being made from two cords tightly twisted in opposite directions and placed side by side. Many strand cords made by plaiting together elements which were themselves plaited do not appear to have been used.

Finished three plait cord is stored in long cylindrical rolls wound to give 283 an ornamental effect. Many strand cord on the other hand is said to have been commonly wound in thin flat rolls like European tape. (See Pl. LXV, *B*.)

The only dyed coconut fiber cord collected was of the three strand 283 variety, but it is probable that the more intricate plaits were also occasionally colored. 386 All the specimens seen were reddish brown, tan or black, but red is mentioned in native stories and Stewart, a reliable authority, speaks of yellow and white sennit used in house lashings. The reddish brown and tan sennit appears to be natural. The Tongan method of deepening the color by baking, if originally known to the natives, has been forgotten. The lightest shade of tan sennit was made from fiber of the leaf sheath. Three methods of coloring the black sennit were described.

The bark of the *mei'i* tree was beaten up with stones and the juice squeezed into large wooden bowls. The finished sennit was then steeped in the juice for several days, until it became black. It was then removed and buried for three days in the mud of a taro patch, washed, and dried. A second method consisted of burying it in the mud for a longer period without the preliminary dyeing, while a third method consisted of rubbing the finished cord with a mixture of *ama* nut soot and water.

It seems probable that when mention is made to red sennit the darker shades of red brown are referred to, but at least some red sennit was made by painting the fiber, apparently after plaiting, with the seeds of the arnotto (*Bixa orellana*). Yellow sennit was colored with saffron, the cord probably being made from the light colored fiber of the leaf sheath. White sennit must, from the nature of the fiber, have been incrusted or painted rather than dyed, and it is quite possible that it was produced by rubbing the finished cord with a paste made from shell lime or from a fine white earth, extensive deposits of which occur in Nuku Hiva. This supposition is strengthened by the fact that fans were whitened in this way.

Although most Marquesan cordage was made from either fau bark or coco- 283 nut fiber a number of other fiber plants were known and used. The most im- 824 portant of these seems to have been the pineapple. Pineapple fiber is still used for thread and for very small fish lines, and is prepared as follows:

The fresh green leaves are taken one by one, laid across a banana log, and scraped longitudinally with any sharp-edged instrument. The bowl of an ordinary metal spoon was seen used for this purpose. Continued scraping removes all the flesh of the leaf, leaving a few soft fibers which are then dried in the sun. The women convert these fibers into thread by rolling them upon the bare thigh with the palm of the hand. To make fish lines either two or three strands of this thread are twisted together, the finished line being passed rapidly through a flame to singe off the lint.

Banana fiber is said to have formerly been used for certain kinds of cord, but this material has not been employed for many years. To prepare the fiber, 283 824 banana stumps were beaten until the soft parts and fiber separated. The fiber was cleaned, washed and dried, and then rolled into cord by the process just described for pineapple fiber. The only remembered use of this cord was in the making of *pehe or* string figure.

Jardin (33, pp. 32-39) mentions the use of certain other fiber plants. No accounts of these were obtained from the natives but the information appears to be reliable. The species are: *pakoko* (*Phaseolus amaenus*) of which Jardin says (33), "The flower shoots are very flexible; the natives make from them lines for catching fish;" *pape*, an unidentified legume, which, according to Jardin, "serves like the *phaseolus amaenus* for the making of threads;" and *pute* (*Pipturus propinquus*) of which the same author says, "The natives use its branches, which are very flexible, to make large ropes."

Other materials, which can scarcely be classed as fiber, were tapa, and a variety of long grass, unidentified, called by the natives *mauomatito ne tetahia*. The tapa was sometimes twisted into strings for the suspension of ornaments, but had so little tensile strength that it was usually reinforced with a strand of coconut fiber about which the tapa was wound. Strips of grass are said to have been plaited into cords which were used by girls in a game, but no more exact information could be obtained.

284 177 A discussion of knots and splices belongs under the general head of cordage and fiber, but it is quite impossible to distinguish at the present time between native forms and those of European origin. The Marquesas became at a very early time a regular port of call for whalers and a number of the natives served and still serve as sailors on European ships. It is not surprising, therefore, that they soon acquired a knowledge of all the European knots and splices and have for many years used them as skillfully as any white sailor.

MATTING AND BASKETRY

MATS

The twin arts of matting and basketry appear to have been less developed 285
in the Marquesas than in any other part of tropical Polynesia and both have been nearly destroyed by European contact. No mats of the better sort are now manufactured and the processes employed are unknown to most of the natives. Only three materials appear to have been used for mats, ti leaves, [824]
coconut fronds, and the leaves of the pandanus. Mats made from ti leaves were small crude affairs, hardly deserving the name. They were used only to line and cover *ma* pits. (See Pl. LXVI, *A*.) They were made as follows:

> A quantity of the leaves were collected and the stems and heavy portion of the midrib removed, without breaking the inner surface of the leaf. These stemmed leaves were laid in bundles of three or four, the face of each leaf being against the back of the one below. These bundles were then placed side by side with a wide regular overlap, always from the same direction, and were pinned together with splints about two inches long made from the midrib of a coconut leaflet or from bamboo. Three of these splints were used to join each pair of bundles, one being placed in the middle and the other two near either end. In doing the work a long splint was used; a portion of the end of the splint was broken off each time and left as a pin. The resultant mat was as wide as the length of the leaves and could be extended indefinitely by pinning on new bundles.

Coconut mats are still regularly made in the Marquesas; the work is done by men and women indiscriminately. They are employed mainly as thatching for houses, to cover large earth oven and in ancient times they were used on [352]
beds, under the fine mats. The coconut mats are made as follows:

> A coconut frond, usually that of a young tree, is split longitudinally and the midrib, to which the leaflets of either half are attached, is pared thin enough to be rather flexible. Alternate leaflets are then directed forward and backward and interwoven in a simple checkerwork. The outer edge of the mat is finished by braiding the tips of the leaflets together in a continuous longitudinal strip. The size of these mats naturally depends upon that of the frond from which they are made, ordinary specimens being 14 to 20 inches wide and 6 to 12 feet long. A common variation of this technique is to employ two half fronds placed side by side, the midribs being joined together by twisting a leaflet around both at intervals of one to two feet. The leaflets of both fronds are then interwoven to form a mat of single thickness like that just described. A still further variation consists in placing two half leaves together with the midribs at opposite edges and interweaving the leaflets in checkerwork. This last technique is rarely used at the present time.

The better Marquesan mats, used principally upon beds, were made from 285
pandanus. These bed mats were as a rule long and comparatively narrow, being 352
intended to cover the space between the two coconut logs. They were of two sorts, the distinction being apparently one of shape and use. The mats upon which the legs rested were called *moena*, those upon which the body rested *hakuaa*, those for the head *p'ai p'ai*. (For shape and arrangements of these mats

285 see p. 263.) According to Handy (personal correspondence) there was a kind
[352] of coarse mat, called *hupau*, which was used by poor people.

No pandanus mats have been made in the Marquesas for several years, and the information obtained in regard to the methods of manufacture was insufficient and sometimes contradictory.

The dry or half dead leaves appear to have been used. The base, midrib and thorny edges were cut away with a pearl shell scraper or knife of the sort used in scraping bark for tapa, leaving two long straight strips about two inches wide. According to one informant, these strips were then soaked in sea water for a few days, washed in fresh water, and dried in the sun. The extreme softness of some of the mats would seem to indicate that the dried strips were beaten or otherwise manipulated before weaving, but no information could be obtained on this point. Before weaving the broad prepared strips were split with a small stick like a needle into narrow sections which varied in width according to the degree of fineness of the contemplated mat. These strips were called *henu* (32). Marquesan mats appear to have been quite coarse as a rule, the width of the strips in all the specimens seen averaging three-eighths of an inch. The weaving was done entirely by women and the manufacture of some mats for special purposes was attended by ceremonial observances. According to one informant the work was done upon a sort of lap-board placed across the knees. Some mats were of single, others of double thickness, but the same methods were employed in making both, the double mats differing only in having each element made from two strips of the leaf laid one upon the other. The weave was a simple checkerwork, the warp and weft being indistinguishable and the strips running at an angle of forty-five degrees with the edges of the mat. Each element, as it reached the edge, was folded over and woven back into the mat at right angles to its former direction. A weft strip thus became, when turned and carried back, part of the warp. In one specimen, apparently a section cut from a large mat, the ends are finished by cutting off the ends of the warp strips and bending back and reweaving these of the weft strips in the manner just described. The sides of this mat are finished by the first method. In a second specimen the edges are finished in a more complicated manner which gives an ornamental effect. (See Pl. LXVI, *B*.) The exact technique can not be ascertained without injuring the specimen.

285 Marquesan mats were rarely if every decorated with woven patterns, but
531 one specimen in the Bishop Museum (Pl. LXVI, *C*) is embroidered in simple overlay with thin strips made from the upper surface of the pandanus leaf and dyed brick red. The decoration consists of six narrow strips, each two elements wide, two of which are placed at either end of the mat as a border while the other four are arranged longitudinally at equal intervals, the outermost strips being about four inches within the sides of the mat. According to Handy (personal
[302] correspondence) the cuttings of women's hair were sometimes saved and woven in tufts around the edges of mats.

In view of the scanty material available for study it is quite possible that
285 mats of finer grade than those described were manufactured in ancient times, but the general inferiority of Marquesan mats is mentioned by various early visitors. Petit Thouars (48, p. 348) says that the mats were coarser and less ornamental than those of the people living further west, and the wife of one of the first European missionaries sent to the group from Hawaii mentions, in a letter

to friends, that she had gathered a few of the women together and was teaching 285 them to weave coarse mats. This statement is so remarkable, implying as it does an ignorance of the art, that it is difficult to account for unless mat weaving, like certain other industries, had become more or less localized so that the valley in which the missionaries settled bought its mats ready made.

BASKETS

The manufacture of all but the simplest baskets had been discontinued in the Marquesas in 1920 and only two types of basket were remembered by the informants [824] questioned. Both of these were made from coconut fronds. The simplest type *koaho* (Pl. LXVI, *D*) is still manufactured, and is made as follows:

> Four short sections of coconut midrib, to each of which three leaflets are attached. are placed two at either end of the proposed basket and the leaflets interwoven in checkerwork to form the broad, oval bottom. Four similar sections, bearing two or three leaflets each, are then placed in pairs above the first four and their leaflets interwoven with the ends of those forming the bottom, making the sides. Three of the bottom leaflets are left projecting beyond the basket at either end and these are braided and the braid carried up over the outside of the basket to the rim. The rim is finished like the edge of an ordinary mat. When the body of the basket is finished, a bunch of tips project from either end. The braids from the bottom are combined with these tips and the whole plaited into a broad flat cord. The cords from the two ends are tied together above the center of the basket to form a handle, and the receptacle is ready for use. Baskets of this sort can be made in a few minutes. They are used principally for carrying fruit.

The more elaborate type of coconut basket called *hakete* (Pl. LXVI, *E*) is no longer regularly manufactured; the specimen figured was made to order by an old woman who remembered the process:

> Young fronds, just beginning to unfold were used and the two sides of each leaflet were folded together before weaving so that the midrib lay along one edge of the strip. The basket was made as follows: The frond was taken and prepared as for mat weaving. Sections 3 to 5 feet long, depending on the size of the desired basket, were then cut from the corresponding portions of the two halves, and the leaflets of each section interwoven tightly at the base, each leaflet passing over two in the direction of its natural angle with the midrib. All the leaflets of each section thus ran in the same direction. The midribs of the two sections were then placed together in such a way that the leaflets of one ran at right angles to the leaflets of the other and were bent into a long oval, their ends being tied together with short pieces of bark string. This formed the rim of the basket. The leaflets of the two sections were then interwoven in a twilled pattern, over three and under three, those of one section forming the warp and those of the other section the weft. This weaving was continued down to the juncture of the bottom with the sides, where there was a narrow strip twilled over two and under two. The bottom, which was very narrow, was made in two thicknesses. The inner layer was formed by interweaving the warp strips of the two sides in a simple checkerwork, their tips being bent back and plaited together in a long strip beneath the checkerwork. The outer layer of the bottom was formed by bringing the weft strips of the two sides together along the middle of the bottom and there plaiting them into a flat braid. The braids from both the inner and outer layers were concealed between the two sections of the double bottom, but their tips projected upward, one at either end, on the inside of the basket. No handle was made, the basket being suspended by cords passed under the rim at either end. Baskets of this sort were used principally for carrying fish.

285 Edge Partington (20, p. 46) figures a closely woven basket of coconut leaves of still a different type. It is oval in outline, with a flat bottom, vertical sides and a flat recurved top, making the opening considerably smaller in diameter than the body of the basket. No baskets of this sort are now in use and the form seems to have been forgotten.

[415] In the collection of the Peabody Museum at Cambridge there are two rather curious sacks from the Marquesas..

The material is split pandanus similar to that employed in mat weaving. The sacks are almost identical in size and construction and are rectangular, 14½ inches long and 11 inches deep. The form is that of an envelope with a triangular flap. The body of the sack is of double thickness, the outside layer being made of strips ¼ inch wide except for the last 3 inches below the top. The sack above this point, the flap, and the inner layer, are woven from much finer strips produced by splitting each of the ¼ inch strips in three. The technique is a simple checkerwork. A loop of twisted coconut fiber is attached to the center of the lip of the sack and passes up through a hole in the flap, protruding for 2 to 3 inches when the sack is closed. There is no information as to the use of these objects.

Jardin (33, p. 36) says that the natives wove coarse baskets from the flexible shoots of the *tutu* (Ceanothus asiatious), but gives no data to their form or the technique employed.

FANS

293 Marquesan fans were of two sorts, ordinary fans, which are still manufactured and used, and chiefs' fans, which were carried by persons of importance and were intended for show rather than use. The chiefs' fans are now obsolete, and no examples have been preserved in the group. They are fairly numerous in collections, however, and the type may be accurately described.

The coconut fans have a broad straight outer end and sides which are nearly parallel at the tip and curve inward smoothly at the base. All the specimens seen were more or less asymmetrical (Pl. LXVI, *F*), but this did not appear to be intentional. They are made as follows:

Young coconut leaflets are folded so that the midrib lies along one edge of the woven strip. The weaving is begun at the outer end, a flat band, twilled over two and under two and as long as the width of the proposed fan, being woven first. The twill in this band is longitudinal, and the whole is rarely more than seven elements wide. The direction of the twill is then changed to vertical, and the fan woven down to the upper end of the handle. To form the handle the two leaflets which are central at that point are crossed and carried down vertically, each succeeding pair being similarly detached from the weaving, crossed and braided in with those already detached until all have been included. The ends of these leaflets, which extend some distance below the fan, are then packed closely together, wrapped with bark string, and cut off squarely at the tips, the whole forming the handle.

The following description of chiefs' fans (Pl. LXVII, *A*, *B*) is based upon an examination of specimens in the possession of M. George La Garde of Papeete, and in various American museums. The weaving appears to have been uniform; the technique being as follows:

The outer end of the fan, which was similar in shape to the coconut fans just described, was finished with a straight band twilled over three and under three. The body of 293 the fan was also twilled, but the weft strands passed under one and over two. The warp strands radiated from the outer end, those next the handle being vertical and parallel while those of the wings diverged more and more as the tips were approached. The exact method of finishing the edges could not be determined. The upper end of the handle was provided with a long spike which was incorporated into the fan, the weft threads being interwoven about it. Near its base it was encircled by ornamental lashings of fine sennit laid on in a simple diamond pattern. The strips used in the woven part of the fan were one-eighth of an inch or less in width. The lower end of the handle might be either a continuation of the wooden spike or a separate piece of human bone or whale ivory. In most cases it was elaborately carved with four small tiki figures arranged in two pairs, superposed upon one another, the figures of each pair being back to back. These fan handles rank among the finest products of the Marquesan artist and it would be difficult for Europeans to better some of them either in design or execution. The woven portion of the fan was whitened by rubbing with lime or with a white clay found in Nuku Hiva, the application being heavy enough in many cases to fill the interstices of the weaving and make determination of the technique and material difficult. The material appears to have usually been the young leaflets of the coconut palm, but it is possible that pandanus was also used in a few instances.

These elaborate fans were made by special *tuhuna* and seem to have had a distinct ceremonial significance, being carried by chiefesses at *koina,* and by chiefs and *ta'ua.* Those of chiefesses at least were inherited in the female line, and appear to have been almost insignia of rank.

It seems well to describe here a very curious fan of tortoise shell, collected [237] in Atu Ona, Hiva Oa. (See Pl. LXVII, *C.*)

The fan consists of a rather rough wooden handle to which plates of tortoise shell have been attached. The object is in bad condition, but the original shape appears to have been rectangular. The handle is decorated with a few tresses of human hair tied with coconut fiber, like those used in hair ornaments. Fans of this sort are said to have been used to keep flies off a dead body while it was undergoing mummification. The specimen obtained had been partially cut up for the sake of the tortoise shell, a good indication that these objects had no religious significance.

ARTICLES USED IN GAMES

481 This section includes the various objects which were used by the natives
in their sports and amusements. The best known and most striking of these
526 toys are the stilts.

STILTS

Marquesan stilts are made in two parts, a shaft and a step. A modern stilt is illustrated on Plate LXVIII, *A*. The shaft consists of a round pole of some light wood, usually fau, with a diameter of 2 to 3 inches and a length of 5 to 7 feet. In the best made specimens the upper end is carved into a rounded grip. The stilt shafts are carved with simple designs.

For convenience in description the step may be considered as having two parts, a long lower section, which rests against the shaft, and a projecting upper portion or foot rest. In an average specimen the lower section is 9½ inches long, with a width of 1¾ inches at the upper end and one inch at the lower end. The inner side is slightly concave, to fit the stilt shaft, the concavity being deepest at the top. The foot rest in the shape of a broad hook, with a strongly convex outer, and slightly convex inner surface, and a rounded end.

532 In the commonest type of ancient stilt steps (Pl. LXVIII, *B*, 2) the space
between the lower section and the foot rest is bridged by a small human figure, its
481 buttocks and legs carved in high relief upon the lower section, while its head rests
526 against the foot rest.

The whole effect is that of an Atlantid or Caryatid. The space behind the body of the figure is pierced and serves as an eye through which the lashings are passed. These figures are carved in compliance with the ordinary tiki convention, with a disproportionately large head, short arms, and short flexed legs. The face shows the usual spectacle eyes, scroll ear, flat nose and broad mouth, and the top of the head is encircled by a narrow band bearing simple incised designs. The arms are shown either at the sides, with the hands resting upon the stomach, or raised on either side of the head as if to help support the weight of the foot rest. Most bodies show slight modeling, the line of the collar bone and the nipples and navel being indicated. The entire body and limbs are usually covered with shallow grooves, arranged to conform to the contours, while similar grooves in either straight or geometric patterns, cover both the inner and outer surfaces of the footrest.

In a specimen in the Peabody Museum of Cambridge a whale's tooth pendant from a cord is carved in low relief around the neck of the figure.

There were a number of variations from this form of step. Two figures carved back to back were often used with their sides against the step, or two figures were placed one above the other, the lowest carved in high relief, while the body of the upper figure was in the round. In this design the upper figure was frequently represented as kneeling (Pl. LXVIII, *B*, 1). A specimen in the Bishop Museum is decorated with two superposed figures of rather fantastic form, and has flat tiki faces carved on the foot rest. (Pl. LXVIII, *B*, 3). The space behind the figures is pierced. This specimen is obviously modern and unused, and it seems probable that it is a degenerate example made for sale.

The step was attached to the shaft by sennit lashings passed around both, one set of these lashings covering the space behind the tiki figure while the second set of lashings encircled the step below it. The shaft was wrapped with tapa at the point where the step was attached. Black and red sennit are said to have been used for the lashings and it is probable that the strands were laid on in ornamental designs. The stilts were used in the ordinary European way, the instep of the foot resting against the shaft. The upper end of the shaft was grasped in the hand and lifted at each step. 481 526

The ancient Marquesans are said to have been unusually expert stilt walkers, running races over smooth pavements and engaging in knocking down contests. Native boys now engage in these contests. The antagonists face one another and, balancing on one stilt, extend the other stilt and make a quick swinging blow at the bottom of the enemy's stilt, recovering instantly. The sport continues until one or the other falls.

In view of the mountainous nature of the country, and the lack of soft or even level ground, it seems impossible that stilts could have been developed locally. They were used in Hawaii, the Society Islands and New Zealand, but do not appear to have been used in Samoa or Tonga. It seems safe, therefore, to consider them as a feature of the marginal, as opposed to the western Polynesian culture. [171]

COCONUT SHELLS

Small children frequently walk on coconut shells in solitary play. This sport is possibly related to stilt walking. From the numerous half shells thrown out by the kitchen the child selects two of equal size which are from the stem end of the nut. He then passes a loop of string through the eyes and inserts the big toe of either foot between the sides of the loops, holding the upper ends in his hands. In walking he lifts the shells by the loop at each step. The game seems to be a solitary one, the child stamping back and forth over the pavement of the house *paepae* and enjoying the clatter.

DARTS

One of the most important Marquesan games was dart throwing, called *teka*. This game is still occasionally played, and a few of the darts were seen. 526

The darts are made from straight pieces of upland reed or from hard wood switches and are about four feet long and one-half inch thick at the head. They are prepared simply by stripping off the leaves.

In playing the game a level open place is chosen.

A small round mound of hard earth is built, and the darts are thrown against this in such a way that they glance up and on down the course. The dart which travels farthest is the winner. The darts are sometimes thrown with a card (*aho*) which is a thin string, knotted at one end. One end is wrapped once around the dart near its center, being held in place by the tension at the knot, while the other end of the throwing cord is wrapped around the first finger, and the shaft grasped with the rest of the hand, keeping the cord taut. When the dart is thrown the cord causes it to rotate, making it fly straighter.

526 There appears to have been a second dart throwing game in which somewhat heavier darts were used.

> In this game the darts were thrown at a mark. In throwing, the larger end of the dart was balanced upon the palm of the left hand, while the smaller end was held in the right hand with the index finger across the tip. The darts were held at about the height of the waist and were propelled with an underhand motion.

[171] Games similar to the Marquesan *teka* were of nearly universal occurence in Polynesia.

POHUTU

Pohutu consisted of bundles of faù leaves rolled up and bound with pandanus strips, the whole forming a ball about two inches in diameter. One of the pandanus strips was left projecting for some inches to form a handle. The game was played by a single child who held the pandanus strip in one hand and batted the ball with the other, or by two children, one of whom held the strip while the other struck the ball. *Pohutu* were also used in the *pei* game, in which geneologies were repeated. The *pei* game, as described by Handy, suggests a close resemblance between the *pohutu* and the well known *poi* balls used by the Maori.

BALL AND PIN GAME

524 Langsdorff (38, pp. 172-3) describes a toy concerning which no information was obtained. He says:

> Under the title of playthings may be mentioned one which consists of a stick about a foot long and an inch thick. A hole is bored in it at one end through which is run a peg five or six inches in length, and at the point of the peg is stuck a little ball of coco-thread. The stick is then struck with another, so that the ball is thrown up into the air. The game is to catch the ball upon the point of the peg. It is very probable that they have other objects of amusement of a similar kind, which may be ranged as playthings, but no others came under my observation.

TOPS

Tops, called *niu*, are still extensively made and used in the group. They are made of fau wood, an average specimen being 7 inches long and 2½ inches in diameter, with a cylindrical body and pointed head. The shape is almost exactly that of an ordinary artillery shell. They are spun by means of a whip. This whip consists of a stick handle about one foot in length with a lash of fau bark 2½ to 3 feet long, which is braided to within a few inches of the tip. Several boys usually play at tops at the same time, the winner being the one who can keep his top in motion the longest.

BOW AND ARROW, AND SLINGS

526 The bow, called *pana*, was not a weapon in the Marquesas. It was some-
411 times used to shoot shrimp, and *po'oko*, a small fish which frequents the rocks,

but as these could be captured by other and much easier methods its seems probable that the shooting was a sport, and that the bow was only a toy. No Marquesan bows seem to have survived, but according to information obtained by Handy they were made of guava or *toa* wood while the arrows consisted of shoots of bamboo, pointed at one end. The arrows, and the species of bamboo from which they were made, were called *kohe*. The bow string was called *aho*. The form of the musical bows now in use would suggest that Marquesan bows were semi-circular in cross section, with a flat outer and rounded inner surface, but this is purely surmise. 526 411

Elaborately made slings were employed in warfare, while a smaller and cruder form was used by boys as a toy. These toy slings were made from ti leaves, which were braided together to form the cords, while the pocket was formed by the natural width of the leaf. In use the long end of the cord was wrapped around the hand and the short, or release end, held between the thumb and finger.

WEAPONS

Every Marquesan tribe was normally at war with its neighbors, but the warfare does not appear to have been of a very deadly character, consisting for the most part of desultory raids for heads or to capture victims for sacrifice. The native armament was entirely offensive and consisted of slings, and of various types of spears and clubs. The bow, although known, appears never to have been used in war. 411

In spite of their knowledge of the sling, stones thrown by hand played an important part in Marquesan warfare, the shorter range of such missiles being compensated for by their greater accuracy. Any Marquesan battlefield would offer an abundance of ammunition, and, to judge from the modern natives, a stone throwing warrior would be decidedly dangerous up to forty or fifty yards.

SLINGS

Slings, with specially prepared sling stones, were used for all long range fighting. The stones were oval or double conical and sometimes weighed as much as half a pound (Pl. LXX, *B*). They were made of heavy close grained rock and the specimens seen were symmetrically pecked, but unground. Porter (49, pp. 86-87) says that they were highly polished by rubbing against the bark of a tree. According to one informant, round sling stones were also used, but the only specimen seen appeared to be unworked. In battle the stones were carried in nets slung from the waist, or, in sea fights, were piled in the bottom of the canoe. [324]

No satisfactory information in regard to the form of the ancient slings was obtained from the ratives, but specimens preserved in the Peabody Museums at Cambridge and at Salem, prove that two forms were in use. (See Pl. LXX, *A.*)

The simpler of these, represented by a single specimen, consisted of a broad flat plait of coconut fiber, between five and six feet long, without a pocket. The cord tapered at either end, one extremity being finished with a loop for the fingers and the other with a simple knot. In another form the two cords were slender and there was a pocket of coconut fiber about five inches long with a central width of about two inches tapering toward either end. The end of the sling that was retained in throwing was also made from coconut fiber, while the release cord might be made either of coconut fiber or of twisted fau bark. A short distance from the end of the retained cord a loop two to three inches long was formed by dividing the braid into two strands which were again interwoven beyond it.

In a specimen in the British Museum figured by Edge-Partington (20, p. 46, No. 2) the end of the retained cord was finished with a small tiki figure of human bone from which hung a hair tassel. As may be seen from the photograph the pockets were often elaborately and beautifully woven. Some specimens of the second type are over five feet in length when ready for action, giving the thrower great range but little accuracy.

A warrior going into battle carried his sling wrapped around his hand and Langsdorff (38, pp. 150-160) says that natives from other valleys, when attending feasts, "commonly have with them a sling for stones, but it is bound around the head so as to have rather the appearance of an ornament than a weapon of defence."

Most early visitors agree that the Marquesan slingers were poor marksmen, but Porter, who fought against them, says (49, p. 87)—"The stones are thrown with such a degree of velocity and accuracy as to render them almost equal to musketry." Evidence of the force of slung stones is offered by a missile of this sort in the valley of Omoa, Fatu Hiva. The stone has been driven into a crack between two rocks so solidly that the repeated efforts of curio hunters have failed to dislodge it.

SPEARS AND LANCES

Several types of spears and lances were employed by the Marquesans, but very few examples have been preserved. There are no authentic specimens in the museums of the Atlantic Coast. The only spear remaining in the group, as far as known, is a short javelin preserved as an heirloom in the family of the chief of Ta'aoa, Hiva Oa. This spear is approximately five feet long with an average shaft diameter of three-quarters of an inch. The lower end tapers to a blunt point, while the upper end is flattened and expanded laterally to form a sharp edged blade whose form may be seen from the accompanying illustration drawn by Mrs. E. S. Handy (fig. 10). An entirely different type of throwing spear is mentioned by Porter (49, pp. 86-87) who says: "The other kind [of spears] are smaller, of a light kind of wood, and are thrown with much accuracy to a great distance. At certain distances from their points they are pierced with holes all around, in order that they may break off, with their own weight, on entering the body, and thus be more difficult to extract." 411

Desgraz (15, pp. 282-3) mentions a toothed javelin intended to break off in the wound, but the reference is obscure.

There are a few early mentions of lances of *toa* wood used in hand-to-hand fighting, but none of these are explicit enough to merit quotation. [824] Fleurieu (23, p. 132) says that these lances were 9 to 11 feet long. Porter (49, p. 86), that they were 14 feet long. Some of these weapons are said to have been toothed, others plain. A curious form of lance, described by a native informant, had upon one side three long barbs, cut in one piece with the shaft, which were deeply notched at the base. When an antagonist had been stabbed, the foremost barb would be broken off by a quick twist and left in the wound while the spear, when withdrawn, would still serve for a second and third thrust.

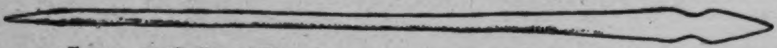

FIGURE 10.—Outline of Marquesan spear.—Drawn by Willowdean C. Handy.

Edge Partington (20, First series, Plate 43) figures two Marquesan spears of unusual form. In these weapons the shaft is made of "a hard red wood" and the heads of a "dark hard wood." The dark wood is almost certainly *toa*.

The shaft of the spear thickens toward the head. The point appears from the drawing to be inserted in a hole in the end of the shaft. There are no indications of lashings or other attachments. The points are rather slender in proportion to the shaft, and are carved with a series of low barbs. In one example the barbs alternate on opposite sides, in the other they are placed in pairs.

Spears with detachable heads, and many pointed spears appear to have [227]
been used primarily in fishing. (See p. 397.)

CLUBS

Two varieties of club were used in the Marquesas, one of which, the *uu* (Pl. LXIX, *D*) is a fairly common object in collections. The *uu*, which have frequently been figured and described, show great uniformity in shape and decoration and only minor differences in size and weight. An average specimen has a length of 4 feet, 6 inches with a head 18 inches long.

The handle of the club is round or oval in cross section, with a diameter of about 1¼ inches and a slight lateral flare at the butt. At its upper end the handle gradually flattens and expands laterally to form a peculiarly shaped head of two distinct parts. The lower part is
oval in cross section, with sharp edges; at the outer end the head thickens abruptly, having 411
a thickness of 3½ inches at the tip. Near the top of the sharp edged part there are two
lateral knobs, each diamond shaped in cross section, with a flat end. The heads of clubs of this 531

411 531 type are elaborately carved according to a set convention, the decoration of the numerous specimens examined varying only in minor details (Pl. LXIX, *A*).

Each side of the club is treated as a separate unit, but the arrangement and position of the various decorative elements on the two sides, and to a lesser degree the designs employed, correspond. The carvings upon a single side are arranged as follows:

> At the lower end of the expanded portion, next the handle, there is a broad transverse band composed of decorative designs. Above this is placed a tiki face, minus the mouth, whose ears rest against either edge of the club. Above this face in turn, filling the space between it and the bottom of the knobs, is a narrow band of carving broken in the center. The inner ends of the sections are connected by narrow curved bands, or the space between them is filled with one or two small detached designs. Above this band, on the line of the lateral knobs, a small tiki face in high relief is carved centrally. The section above the lateral knobs is divided into two equal parts by a low longitudinal keel and upon each of the halves thus formed is carved a large circle or oval having in the center a head in high relief from which lines run radially to its circumference. Above these circles, on the extreme end of the club, a flat tiki face is carved centrally. The curve of the thick outer end of the club extends upon either side to within about two inches of the lateral knobs and in a few specimens small faces, directed laterally, are carved at its lower extremities.

Practically all old *uu* have a glossy black finish given by burying the finished implement for some time in the mud of a taro patch and then rubbing and polishing with scented coconut oil (*pani*).

411 The *uu* have always been much sought after by collectors and this demand has resulted in their continued manufacture although the best modern examples are only caricatures of the ancient specimens. The carefully worked out contours of the old clubs have given place to flat surfaces and angles, and the simple and rigidly conventionalized decoration to elaborate and meaningless carvings. The finish of the modern specimens is usually rough, and the wood is always left the natural color, making them easily distinguishable. (Pl. LXIX, *B*.)

The second type of Marquesan club, called *parahua* (Dordillon, 17) is also well represented in collections. It has a handle identical with that of the *uu* but the elaborately worked out head is replaced by a sharp edged blade closely similar in form to that of a modern American canoe paddle (Pl. LXIX, *E*). Weapons of this type appear never to have been carved or blackened, and are as a whole longer than the *uu*. Some of these paddle clubs are remarkable for their size and weight, one specimen in the Bishop Museum being 7 feet, 9¼ inches long with a blade length of 2 feet, 10½ inches and a maximum blade width of 7 inches.

In many *uu* and *parahu* there is a small hole pierced through the expanded lower end of the handle, probably for the attachment of a wrist loop, and in some specimens the grip is wrapped for a distance of 5 to 8 inches with fine plaited coconut fiber cord to which tufts of white beard are attached at irregular intervals. 411

An example of a chief's son's scepter (*kouvai*) (Pl. LXIX, *G*) was obtained from a burial cave in the valley of Atu Ona, Hiva Oa. According to informants a *kouvai* was made for the son of a chief at the time a new house was built for him. It was thrust into the thatch and left there, and was never carried or used. Elaborately carved clubs resembling the *uu*, but degenerate in form, are still made by the natives and sold as chiefs' scepters or insignia, but it seems doubtful whether the form is an ancient one. 411 293

The staffs carried by chiefs and persons of importance were made of *toa* wood, with a shaft diameter of ¾ to 1¼ inches and a length varying from 5 to 10 feet. They were rarely carved, but a specimen in the Bishop Museum bears two pairs of small tiki figures carved upon the shaft at considerable intervals. The lower end was flattened and expanded to form a narrow flat edged blade, the amount of this expansion being highly variable (Pl. LXIX, *F*). One specimen in the Salem Museum is really a narrow paddle club.

The upper end of the staff was decorated with a band of woven coconut fiber and terminated in a pompom of human hair which was attached as follows (Pl. LXIX, *C*): The tip of the shaft was carved into a projecting pin about 1½ inches long. The hair, in the form of small locks attached to coconut fiber cords, was then applied piece by piece, the cords being tightly interwoven about the pin. In one specimen in the Salem Museum a tress of white beard is attached to the tip of this braiding. The sleeve of coconut fiber enclosing the upper end of the shaft consisted of a weft of single fibers applied upon a longitudinal warp of thin cords of plaited fiber in a very close wrap weave. This sleeve was usually decorated with simple designs produced by variations in the weaving or with geometric figures in black produced by embroidery in human hair. The technique of this embroidery is rather interesting, a warp strand being detached from the fabric and wrapped closely with the hair, then re-incorporated. The figures are as a rule large and simple.

It was not determined whether or not these staffs were over used as weapons.

The only Marquesan weapon suitable for close combat was the *ake henua* which, according to Handy, was a double pointed spike of *toa* wood having about the center a loop of cord through which the wearer's wrist was passed. This weapon was carried only by *toa* or great warriors. It is said sometimes to have been thrown. 411

HEAD TROPHIES

Marquesan warriors preserved and elaborately decorated the heads of slain enemies, although no trace of these trophies was found either in the Marquesas or in American museums. What appears to be an accurate description is given by Desgraz (15, pp. 296-298). He says: 727

> 727 . . . bony skull, the lower jaw of which is firmly held in place by small plaited strings, very fine and very well arranged around the articulation. These are united by another larger and stronger plait which is prolonged in front of the incisor teeth of the two mandibles and passes under the chin and ends at the nodes behind the arch of the palate. At either side of the dental arch a large and strong wild pig tusk is fastened by these plaits to the bone of the cheek so that it appears to spring from the mouth of the individual in the same manner that it sprang from the mouth of the animal to which it belonged. A piece of hard wood, roughly carved, fills the anterior opening of the nasal fossa and more or less represents an abnormal nose. The eyes are imitated by large pieces of pearl shell fitted into the orbits [of the skull]. A small round piece of tortoise shell serves in place of pupil and a few hairs placed between the shell and the orbit represent the lashes of this lustrous eye. Finally, to complete this hideous assemblage, a few tresses of the vanquished one's hair are attached to the lower jaw by way of a beard and hang down below the chin.

Radiguet (52, p. 67) gives a description of such a prepared head which he found in a hole in one of the *me'ae*, as follows:

> . . . human skull whose orbits were filled with brilliant disks of pearl shell, flat, and as large as a five franç piece. A hole pierced through the middle showed black in guise of a pupil. A piece of pointed wood filled the nasal cavity. Two teeth, long and menacing, had been driven into the alveolus of the canines. Finally, cords of coconut fiber attached to the maxilaries numerous tufts of hair disposed as a beard and to the ears oval wooden plaques whitened with chalk. The lower jaw was lacking.

A crude drawing of a head trophy of this type appears in one of Langsdorff's illustrations (38, p. 118).

The prospectus of Von den Steinen's forthcoming book on Marquesan art contains an illustration of a human skull covered with painted tapa, but it differs entirely from the trophies just described and was probably a religious object. The paintings upon it apparently represent facial tattooing.

COMPARISONS

411 171 The use of slings, with or without specially prepared stones is almost universal in Polynesia and Micronesia, with a scattering use in Melanesia. In New Zealand the sling appears to have been obsolecent, being regularly used only by the Urewera tribe (Tregear, 82, pp. 314-15), and prepared sling stones seem to have been unknown. In the Society Islands (Ellis, 71, p. 290) and in Samoa and Tonga prepared stones do not appear to have been used although the sling was important. In Hawaii and the Maquesas oval or bluntly double conical stones appear to have been normally used. In Micronesia the use of specially prepared sling stones seems to have been universal. The Micronesian specimens are easily distinguishable from those of either Hawaii or the Marquesas because of their greater length and smaller proportional diameter. Some of them are almost cigar shaped.

It is not possible to get exact information as to the type of sling used in Samoa and Tonga. In Tonga the bow and arrow was the important missile.

The Hawaiian and Micronesian slings are much cruder in construction than the Marquesan slings, and have little in common with them. The Marquesan and Society slings, on the other hand, are practically identical, corresponding not only in form, but even in such minor details as the occasional use of fau bark for the release cord. It is rather curious that such close correspondence should be coupled with the use of prepared stones in the Marquesas and their absence in the Society Islands. 411 171

The information on Marquesan spears is too incomplete to justify extensive comparison, but it is suggestive that the practise of cutting or piercing the shafts of javelines so that the head would break off in the wound appears to have been limited to the Marquesas and New Zealand. The thrusting spear with long easily broken barbs appears to have no Polynesian parallel, but is rather suggestive of certain north Australian forms.

A comparison of Polynesian club forms is especially interesting. The Hawaiians seem to have made only secondary use of the club, and the Hawaiian examples for the most part are short bludgeon-like weapons of rather inferior workmanship. There are some indications that a longer bat-like type was also in use, but it seems to have been numerically unimportant. The Marquesans seem to have entirely lacked short clubs, both their types, the *uu* and paddle club, being heavy and of unwieldy length. The natives of the Society Islands used clubs of two types, one a short bludgeon, the other a long club with a sharp edged lozenge shaped head. Examples of the long club examined strongly resemble the spears of the Cook Islands which in turn, appear to be copies of metal prototypes. The Maoris used several types of club which seem to fall into two classes, long staves and short, sharp edged weapons, such as the mere. The Maori weapons are well known. In Samoa and Tonga we find a great variety of clubs, most of which are of types also found in Fiji. These weapons have been fully described by Churchill (69). As a whole they show little resemblance to the forms found in marginal Polynesia. Even the nuclear Polynesian paddle clubs bear much less resemblance to those of the Marquesas than the Marquesan ones show to some Melanesian weapons, notably those from the Solomon Islands.

No clubs at all resembling the Marquesan *uu* appear in other parts of Oceania, and it seems certain that it is a local development. If we ignore its decoration we find that the *uu* differs from the paddle club only in the thickening of the end and the lateral knobs. The handles of the two types are identical, and in both the head has a rounded outline, flat oval cross section, and sharp edges. It is evident that the *uu* as a whole represents a highly conventionalized face to which the knobs bear the relation of ears. As projecting ears are a common fea- 411 171 532

411 ture of Marquesan figures it is quite possible that the knobs might be added to
171 a paddle form on which a face had been carved with the idea of rendering the
human likeness more complete. The thickening of the end is more difficult to
532 account for, but this also may have arisen from the native artistic convention which calls for wide curves over the eyes. It is but a slight step from the paddle club to the *uu*. Evidence of the priority of the paddle club is offered by the use of small replicas as chiefs' insignia.

The distribution of narrow-bladed staves is especially interesting. In Poly-
411 nesia their use appears to have been limited to two localities, the Marquesas and New Zealand, with a related form in Easter Island. The Marquesan staves are as a rule longer than those from New Zealand, but the blade form is practically identical, the differences between the two types lying in the treatment of the upper end, or head, which in New Zealand was usually carved into a head with a projecting, pointed tongue, and in the Marquesas was finished with a pompom of human hair. In both, the shaft immediately below the head was covered with a woven sleeve. The Easter Island implements are clearly related to these staves, but differ from them in having a broader blade, no sleeve, and an upper end carved into two heads placed back to back. The Marquesan staves grade into the paddle clubs, although they always retain the characteristic decoration of the head. As paddle clubs appear to be lacking in both New Zealand and Easter Island it seems improbable that the stave was developed from this weapon. Certain Melanesian digging sticks now in the Field Museum are identical in blade form with the Maori and Marquesan staves, and there are even a few examples in which the upper ends are carved and decorated. A. B. Lewis of the Field Museum says that he has frequently seen digging sticks employed as staves by the older men in Melanesia, and it would appear not improbable that the staves of the Maori and Marquesans have been derived from some such tool. The fact that the Maori stave was an important weapon does not militate against this assumption, as even among the Maori digging sticks were sometimes used as weapons while many of the Melanesian examples are known to have been used interchangeably as tools and clubs. The Fijian chiefs' staves lack the flattened blade, just as do many of the Fijian digging sticks.

It is rather curious that large weapons edged with sharks' teeth appear to have been entirely lacking in the Marquesas, although at least two forms were in use in the Society Islands (Ellis, 71, p. 297, p. 413).

Weapons resembling the Marquesan double pointed spike (*ake henua*), were rather common in Hawaii, while a related form was important in the Society Islands. Their use in Samoa and Tonga seems doubtful, although the data from those islands is still too incomplete to allow of a definite statement.

APPARATUS USED IN FISHING

The Marquesans used four methods of fishing; poisoning, spearing, hook and line fishing, and net fishing. The first of these methods was by far the simplest, but owing to the rugged nature of the coast there were few places in which it could be profitably employed. Three substances were used; the fruit of *Barringtonia speciosa*, the flowers of *Tephrosia piscatoria*, and the leaves and young shoots of *Rhyncosia punctata*. (The use of *Rhyncosia punctata* may be post-European.) The use of the Barringtonia appears to have been limited to small pools in the rock; the fruit was split with a flake knife and rubbed on the rocky sides of the pool, stupifying the fish and causing them to rise to the surface. The Tephroisia and Rhyncosia were used for deep fishing. Holes or small caves among the rocks were located by diving. A quantity of the crushed poison was enclosed in leaves, forming a tight bundle, and with this the fisherman dived, shaking the poison out into the caves. He then returned to the surface and waited for the stupified fish to rise. 226 278 [824]

FISH SPEARS

Large fish, especially the giant ray (*fāfaua*) were speared from canoes. The spear was provided with a detachable head to which a line was attached. The head was made of hard wood or bone, its upper end was cut with a jog which rested against a corresponding jog on the end of the shaft, and was attached to the shaft by light lashings. The form of this head can be seen from the accompanying photograph of a specimen in the United States National Museum (Pl. LXX, *C*), although the carved decoration is unusual. 227

Smaller fish were speared from the rocks with a many-pronged spear. Only a general description of this implement was obtained, but one form called *matavau* (Handy) is said to have had twelve prongs attached to the shaft by three rows of sennit binding. The natives also swam after certain species of fish and speared them in the water, a practice still common in the Society Islands and the Tuamotus.

The spearing of fish from the rocks, and most of the net and hook fishing, were carried on at night by the light of torches. These torches were of three sorts; those made of sugar cane (now obsolete), of bamboo and of coconut fronds. 226 373 [824]

The sugar cane torches are said to have been made by tying up the leaves of a dry stalk into a compact bundle. Coconut torches were made from a single dry palm frond. Beginning at the tip, the leaflets were directed upward and tied by passing single leaflets around the bundle at intervals of a foot or more. Such a torch when lit at the tip needed no tending, and would burn down gradually with a good light. Bamboo torches were made by crushing a long dry joint of bamboo, care being taken not to break it across. The scattered fibers held the bunch of dry strips together without additional binding. This form is the one most used at present for night fishing from canoes.

HOOK AND LINE

227 Line fishing was carried on both from the rocks and from canoes. On the southern side of Hiva Oa the natives resorted to submerged banks which lay several miles off shore, and fishing expeditions to the various uninhabited islands of the group were not uncommon. The lines used in deep sea fishing were made either of fau bark or coconut fiber; those used by the women in fishing for small fish were made of pineapple fiber. (See p. 379.)

A variety of hooks were used, their size and material varying with the nature of the fishing. A tiny hook, made from a single thorn from the edge of a pandanus leaf, was used to catch the little fish in the rock pools. Larger hooks were made either from pearl shell or human bone or a combination of the two. Simple shell hooks (Pl. LXXI, *A*, 1) were laboriously ground out of a thick [321] pearl shell. The gleam of the nacre served as a lure and made bait unnecessary. Such hooks were barbless with only slightly recurved points and had much the shape of a "J." The upper end was slightly notched on one or both sides for the attachment of the line. A more elaborate form of one piece hook is shown (Pl. LXXI, *A*, 2). A composite hook made entirely of pearl shell was also employed. (Pl. LXXI, *A*, 3.) One section of this hook corresponds to the one-piece hook except for slightly greater angularity at the bend. The second piece consisted of a simple band of shell of the same width and length as the shank of the first piece. It was bound to the shank with lashings near the top and bottom, the nacre sides of the two pieces being brought together so that the surface of the completed hook was dark except at the barb. The type is represented only by several specimens in the Salem Museum, and no information in regard to it was obtained in the Marquesas. This form seems to be a purely local development and does not occur in other parts of Polynesia.

One-piece hooks of human bone were occasionally used, made from the curve of the lower jaw. Desgraz (15, p. 285) says that they were sharper than the pearl hooks and that their form was angular rather than oval, but as no specimens have been preserved in American collections exact description is impossible.

Composite hooks of shell and human bone were used to troll for bonito. The ancient form with only slight modifications continues in use to the present date. (See Pl. LXXI, *B*.)

The body of a hook of this sort consists of a strip of shell 3½ to 4½ inches long and about ⅜ of an inch wide, pointed at one end and square at the other. In making this strip the pointed end is ground from the valve. Some strips are as much as ⅜ of an inch thick at the point while the body of the strip is rarely over 3/16 of an inch thick. The outside of the shell, which forms the bottom of the strip, is ground down until it shows a good luster with a pink, yellow or brown tint. The color is very important, for the strip serves as a lure, and fish refuse to take hooks which are not of the right shade. The thick point of the strip is pierced by a single horizontal or vertical hole. The square end has along either side two to six notches which are used to facilitate tight lashing of the bone barb. In the specimens examined there was also a short longitudinal groove in the center of the lower surface which served no practical purpose. The point of the hook is of bone, with a slight but well marked barb just behind the tip on the lower side. The modern Tahitian and Tuamotuan hooks of the same type are usually barbless. The base of the bone point is pierced with two holes. The point is attached to the strip by close lashings, formerly of coconut fiber cord. The ends of the lashings are gathered together into a single strand at the forward end of the bone point and carried along the upper surface of the strip to its pointed end, where they are again attached to it by lashings passed through the hole in the strip. The strand is continued beyond the hook and serves to attach the whole to the line. As the lashings at the inner end of the hook are loose enough to allow some play, the pull of the line comes directly at the base of the bone point. When a fish strikes, the pull is said to draw the point slightly downward and inward, making escape more difficult. This movement, if it occurs at all, is negligible, but the pull coming at this point does serve to tighten the lashings and prevent the point from slipping on the strip. The barb upon the point is of little value, and unless a tight line is kept the fish will escape. 227

In some hooks of this type a small bunch of pig's hair is tied transversely at the rear end of the strip as an additional lure but this is not a constant feature (Pl. LXXI, *B*, 1). In one specimen collected an additional strip of shell is tied to the upper side of the main strip, probably with the idea of strengthening and weighting the hook. [237]

That sinkers were employed in line fishing is shown by two terms given by Dordillon (17); *pokau*, which is defined as a sinker, and *pokoe*, which is defined as a stone twisted with a fish hook which falls off when the hook sinks to the depths. It seems probable that such sinkers were unworked pebbles.

Dordillon also gives a term (*pe'etai*) which he translates as "to fish with a line while swimming" but this method is now obsolete and no information was obtained in regard to it.

NETS

Net fishing was probably the most important of the Marquesan methods of fishing, and a considerable variety of nets were employed. Very few of these nets have been preserved in collections, however. The only specimens studied were two imperfect fragments in the Bishop Museum. One of these fragments evidently formed part of a small net in the form of a flat pouch or envelope with square corners. (Pl. LXXI, *C*). 227 286

The net is woven of two-strand fau bark cord hardly more than 1/32 of an inch in diameter with a very small mesh decreasing in size from 3/8 of an inch at the bottom to 3/16 of an inch at the top. The upper edge is finished with a single strand of twisted fau bark cord about three times as heavy as that forming the body of the net. Immediately below this edging a second cord of the same weight runs around the net, apparently serving as a drawstring. The second fragment is so badly torn that the original form of the net cannot be determined. It is woven of extremely fine two-strand pineapple fiber cord scarcely heavier than carpet thread, with a uniform mesh of 5/8 of an inch. The form of knot employed in both nets may be seen from the accompanying drawing (fig. 11).

227 286 The only large nets used in modern times are long seines woven from commercial cotton cord with needles and spacers of ordinary European form. Small circular hoop nets and flying fish nets are also made from cotton cord of finer grade. A netting needle, similar to that used in Hawaii, is used to make these nets. The work is begun at the top and the envelope is held open, as the work progresses, by pointed strips of bamboo.

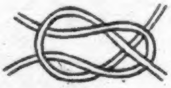

FIGURE 11.—Drawing of knot used in fish nets.

226 227 The natives of Pua Ma'u, Hiva Oa describe ten varieties of net formerly made and used, as follows:

(1) **Timana:** A circular bag net about three feet deep and two feet in diameter woven of either fau bark or coconut fiber. Three ropes were attached to the upper edge of this net at equal intervals, and were woven together into a single strand above its center. A large stone was placed in the bottom as a sinker, and the skin of a squid was attached to the juncture of the ropes as bait. The net was allowed to lie on the bottom for some time, and was then pulled up, the pull of the ropes closing the net and imprisoning any fish within it.

(2) **Maa:** A small dip net with a wooden hoop and pole, usually made of pineapple fiber.

(3) **Ho'ohe to'o:** Same as *maa*, except for the size of the net. *Ho'ohe* is the name of a small fish.

(4) **Pafio:** Same as the *ho'ohe to'o*, but of larger mesh and heavier material. This was used to catch crabs on the rocks.

(5) **Pafio Mao'o:** Net used for flying fish. There is some doubt whether this form is aboriginal, its introduction is ascribed by some to early Hawaiian missionaries and by others to certain Gilbert Island fishermen who at one time lived in the Marquesas. The modern flying fish net consists of a small bag net woven between the prongs of a forked stick, the outer edge being held taut by the tension of the sticks. Fork and net are attached to the end of a pole 10 to 15 feet in length. This form of net is used only in night fishing from canoes. A large torch is set up in the canoe and the flying fish, attracted by the light, rise to the surface and lie there. The net is slapped down over the fish, which jump upward and become entangled in it. The man using the net stands up, and as the native fishing canoes are extremely narrow and unsteady it is an exciting sport.

(6) **Pafio ihe:** A net identical with the flying fish net except for its smaller size. It is used for *ihe*, a variety of small fish.

(7) A special net was used in the Island of Ua Pou for catching parrot fish. The name of this net had been forgotten. It is said to have been about three feet square. The top was held open by crossed sticks. To the juncture of these sticks a live parrot fish was tethered by the gill. The net was then towed along the rocks where parrot fish were plentiful. According to the natives, each parrot fish has a special area from which it feeds, driving off invaders of the same species, and as soon as the tethered fish entered such a private domain the owner came out and attacked it. The net was then drawn up.

(8) **Paoa:** A long seine of fau bark. This form could be used at Pua Ma'u, where the beach shelves gradually, but was useless in most localities. One end of the seine was carried out from the beach by men wading or swimming and then brought back to the beach again at a point 75 to 100 yards away. It was then drawn in from both ends, with all the fish within the circle trapped. Such seines were provided with light wood floats along the upper edge and stone sinkers on the bottom. 226 227

(9) **Fifi:** Probably the same as the *fi'ifi'i* of Dordillon's Dictionary, which he defines as a small net to catch turtles. According to native informants this was a very strong, large meshed seine made of cord twisted from the fiber of the coconut spathe. It was much wider than the *paoa* but like it was provided with floats and sinkers. The method of use was as follows: The net was set a short distance off any rocky place where the turtles were abundant, its line running more or less parallel to the shore. When in place, a number of men jumped into the water between the net and the shore and frightened the turtles, which, in their efforts to escape, became entangled in the net. As soon as it was evident from the movement of the floats that one had been caught a man dived down, disentangled the turtle, and tied it with fau bark cords, bringing it to the surface and giving it to the men in one of the canoes. The net was not drawn until the fishing was ended. From ten to twenty turtles were sometimes caught in this way in a single day.

(10) **Upena:** By far the most important of the Marquesan net forms. Descriptions obtained by Handy in Atu Ona and by the author in Pua Ma'u differ in some details. According to Pua Ma'u informants the cords composing it were made of fau bark twisted by rolling them on a smooth breadfruit log. According to informants of Atu Ona the cords were composed half of fau bark and half of plaited coconut fiber and were rolled upon the thigh. Both agree that at the time of rolling the cords were rubbed with a red earth called *ka'aea* which gave them a permanent color supposed to attract the fish. Ten men with coconut baskets were required to bring the earth for dyeing a single net. The net was woven by women skilled in the art under the direction of a *tuhuna upena,* the labor occupying twenty to thirty women for ten days or more. The work was carried on in a special house and was attended with various religious observances. In Pua Ma'u the *upena* was said to have been circular, about thirty feet across at the rim and decreasing gradually toward the bottom. The whole net was woven in one piece, the mesh being two fingers wide on the sides and somewhat less on the bottom. The upper end was held open by flexible poles or withes of *toa* wood placed about the circumference. The weight of the withes caused the net to sink. The net of Atu Ona is said to have been 30 to 36 feet square, tapering toward the bottom, which was finished by a special piece, "shaped like the crown of a hat," which was called *to'o pu'u.* Along the upper edge of each side was fastened a log of *toa* wood, to either end of which a line was attached.

The method of handling the *upena* appears to have been the same in both localities.

Four canoes set out about four hours before dawn with the net, two of these being large craft which carried eight men each, and two smaller, with a crew of three men each. When the fishing place was reached each of the large canoes put out four anchors, two at the bow and two at the stern. These anchors apparently were placed by the small canoes, one of which, called *vaca iti,* went to the east side while the other, called *vaca voho,* went to the west. The net was then lowered between the two large canoes. When the net was submerged the *tuhuna* who supervised the fishing dived in and directed whether it was to be moved backward or forward. A skilled *tuhuna* was said to be able to see the fish under water and to hear them when they entered the net. When he considered the net full it was hauled up. The *upena* was drawn several times on a single trip.

Fishing with the *fifi* and *upena,* and probably with the *paoa,* was a community matter, and had associated with it elaborate religious observances. 226

This probably holds good also for the organized fishing expeditions to offshore banks and desert islands in which hooks and lines were used. Ordinary fishing, on the other hand, whether with small nets or hook and line, appears to have been a matter of individual initiative. The community fishing was participated in by men only, while individual fishing was done by both men and women.

According to information obtained by Handy, a strong large-meshed net (*upena fi'ifi'i*) was used for catching the hammer-head shark, called by the natives *matake*. The cords of this net were dyed with red earth like those of the regular *upena*. The net was long, one end resting on the bottom while the other was held at the surface of the water by floats. A number of nets of this sort were set in a good locality and left for the sharks to be caught by the gills.

According to another informant, sharks were not caught in nets, but were taken by tempting them alongside a canoe with meat and passing nooses over the head and tail; the nooses were drawn taut and the shark was pulled on board and clubbed. It is probable that both methods were in use, being employed in different localities or for different species of shark. The flesh of the hammer-head was considered the best for eating, but even small tiger sharks are still caught and eaten by the natives.

Dordillon gives a term *auoa*, which he defines as "long braids of leaves to hem in fish." This probably refers to a seine of coconut leaves of the sort still commonly used in the Tuamotus for fishing in shallow water. This method is not used by the Marquesan natives at the present time and there are few places in the islands where it could have been employed. The Tuamotuan seines are simply long ropes of coconut fronds tied together in such a way that the leaflets project in all directions. They are used to surround sections of the reef or lagoon, being gradually drawn in until the fish are confined in a small compass. The fish are then speared. Whole villages assist in this sort of fishing, the seines being in some cases nearly half a mile long.

Octopi are commonly fished for by diving and thrusting a blunt pointed stick into the center of the arms. The animal twines its arms around the stick and is thus easily withdrawn from it hole. The use of octopus hooks in ancient times is doubtful, but according to one informant octopi were formerly caught with three hooks lashed back to back a short distance above which was attached a white stone. This grapnel was let down immediately above the octopus which was irritated by the stone and began to reach for it. As soon as one of the hooks had taken hold, the animal was drawn up with a quick jerk.

At least one form of fish trap is said to have been used in ancient times, but no description of it was obtained.

MUSICAL INSTRUMENTS

DRUMS

In musical ability the Marquesans appear to have been inferior to the Tahitians and the Hawaiians, but they possessed a number of musical instruments, the most important of which were drums (Pl. LXXII, *A*). That these were made in a variety of forms and sizes is indicated by the following terms from Dordillon's Dictionary[2]: 534

[192]

Pahu.	Drum.
Pahu peiei.	Small drum.
Pahu ua.	Double drum.
Pahu me'ae.	Large drums used in the *me'ae.*
Pahu putuu.	Short drum.
Pahu oeoe.	Small drum used to accompany songs.
Pahu tapete.	Long narrow drum.
Umi.	Drum.
Teveteve.	Drum.
Pere.	Kind of small drum.
Uhaki.	Small drum played with the *uhaki.*
Pahu vanana.	A thin drum, perhaps six feet high, made of *tou* wood; it was beaten as an accompaniment for the singing of the *vanana* by the men in the *me'ae.*
Utu.	A small drum used at feasts.
Pahu umi.	A small drum.
Tutu.	Small drums played on the *tohua.*
Pahu anana.	Big drums beaten from a *paepae.*

Unfortunately several of the drums in this list can no longer be identified. The *pahu ua* must have constituted a distinct type, but no information in regard to it was obtained and no examples seem to have survived. Except for the *pahu ua*, all the Marquesan drums figured or preserved conform so closely to a single type of design and construction that it seems probable that they differed only in size and in minor details. They may be described as follows:

> The smallest drum seen was slightly more than thirteen inches high with a head diameter of six inches. The largest, a *pahu me'ae*, had lost its base through decay, but must originally have been more than eight feet high with a rim diameter of nineteen inches. The bases of even the largest drums seem to have been comparatively low, the differences in height resulting from variations in the length of the body.
>
> All drums were hewn from a single piece of wood. Some very large drums were [322] apparently made from temanu, but the decay of the wood made identification difficult. Drums of ordinary size appear to have been uniformly made of *mio;* and as only the dark heart [324] wood was used, very large trees must have been required. The body of the drum was shaped with adzes and the interior hollowed with chisel and mallet. Fire does not seem to have been used.
>
> The body of the Marquesan drum was cylindrical. In drums of ordinary size the diameter was slightly greater at the bottom than at the top, but in the very large temple drums

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[2] Translation and explanatory notes by E. S. Craighill Handy.

534 [531] the diameter seems to have been uniform. The bodies of at least 90 per cent of the drums were decorated with a series of shallow horizontal grooves, apparently made with an adz. In a few drums the upper part of the body was decorated with simple angular-geometric designs of the sort used on house posts. It is possible that the bodies of some of the temple drums were smoothly finished. The lip of the drum was somewhat recurved, as in round bowls of normal type, the greatest width of the interior being one to two inches below the rim. The bottom of the excavation was bluntly conical. The thickness of the walls varied in different specimens but rarely, if ever, exceeded one inch.

[531] The body and base of the drum were hewn in one piece. The interior of the base was cut away and its sides were pierced at intervals so that the body seemed to rest upon six to eight thin, flat legs connected at the bottom by a broad ring. The ring was commonly decorated with a few broad shallow horizontal grooves. As a rule, the legs of the drum were smoothly finished, but a few seem to have been decorated with simple angular designs. Through the top center of each leg two holes were pierced, one above the other, for the attachment of the hoop lashings. In drums of ordinary size the base was wider than the body and tapered inward toward its top, but in the temple drums the diameter of base and body seems to have been uniform.

[531] A wooden hoop made of a split withe encircled the base of the drum just below its juncture with the body. It was attached to the drum by means of ornamental lashings of small sennit, which were passed through the holes and around the sides of the legs. In all the drums seen natural color sennit was employed and the design was a simple diamond. In one specimen tufts of human hair had apparently been laid upon the outside of the hoop before the lashings were put on.

534 284 [231] The drumhead was made of thin shark skin, put on wet. In the edges of the skin, which extended for some distance down the sides of the drum, vertical slits were cut at regular intervals. A heavy cord of flat braided sennit was passed several times around the drum, threaded in and out through the slits in the skin. This lashing was so arranged that there was always an equal number of strands inside and outside. Thus, if we designate four successive slits in the skin as A, B, C, and D, the cord on the first circuit would lie outside between A and B, inside, against the wood, between B and C, and outside again between C and D. On the second circuit it would lie inside between A and B, outside between B and C, and inside again between C and D. In this way a ring of sennit was formed around the lower edge of the head. The arrangement of the lashings connecting this ring with the wooden hoop on the base of the drum is clearly shown on Plate LXXII, *A*. The lashings consisted of a series of loops of heavy sennit cord. The upper ends of the cord passed under the outer lashings of the ring on the outer sides of each pair of slits. The cords forming the outer sides of adjoining loops thus crossed each other at the slits and were carried down nearly parallel. For approximately the lower third of their length the cords were united into a single strand by wrappings of sennit. According to one informant, carved tubes of human bone were sometimes threaded upon the paired cords just above the sennit wrapping. When it was necessary to tighten the lashings these tubes would be forced upwards, drawing the cords together, thus increasing the tension. A different method of tightening the lashings appears to have been employed ordinarily. A number of turns of ribbon-like sennit were wrapped around the body of the drum about midway between the ring and hoop. When these were drawn taut the vertical loops of sennit were forced inward against the body of the drum, tightening the head.

534 Stewart (59, p. 258) says that the small drums used at dances were made of kou wood, and had a small hole in the center of the bottom. He also says (59, p. 257) that the heads of the temple drums were made of ray skin instead of shark skin. No drums with a hole in the bottom were found, but Stewart is a thoroughly trustworthy observer and his statement is sufficient to establish their existence.

Even the large temple drums appear to have been beaten with the hand. Because of their great length they were placed on the ground beside special platforms on which the drummers stood.

TRUMPETS

As Marquesan musical instruments, trumpets (*pu*) stand next in importance to drums. They are made of *mio* wood and of Cassis and Triton shells. 534 321

The body of the wooden trumpet was a simple tube tapering toward the upper end. (See Pl. LXXII, *D.*) Dimensions of an average specimen are: length, 1 foot, 9 inches; diameter at mouth, 6¾ inches; diameter at upper end, 3 inches. The walls vary in thickness from slightly less than ½ an inch at the lip to approximately 1 inch at the upper end. A mouth piece of bamboo, 8 inches to 1 foot in length and approximately 1 inch in diameter, was fitted into the small end of the tube. It was not attached in any way, and when the instrument was not in use was usually removed and placed inside the wooden part. A few wooden trumpets were decorated with carving; an unfinished specimen in the Bishop Museum bears several designs which appear to have been copied from tattooing.

The trumpet was blown in the same manner as an European bugle. The trumpets still in use give a remarkably clear and penetrating note. One old informant stated that trumpets of this sort were blown by returning fishing parties to summon the villagers to the shore, but no other uses were mentioned.

Two varieties of shell trumpet were used by the Marquesans. The smaller, which appears to have been somewhat rare, was made from the shell of *Cassis rufa* by grinding away the apex of the whorl. A Cassis shell trumpet [825] found in a burial cave in Atu Ona, Hiva Oa, can still be blown and gives a clear but not very loud note. (See Pl. LXXII, *B.*)

Most Marquesan shell trumpets appear to have been made from the large shell of *Triton tritonis.* The larger shells of this variety were brought up by [825] divers from considerable depths and seem to have been highly valued.

To prepare the shell for use a hole was ground in the side of one of the whorles a short distance below the tip of the shell, and above this a mouthpiece, made of a small gourd, was attached with breadfruit gum. Handy was informed that the mouthpiece was made of bamboo, but this practice certainly was not general. Langsdorff (38, p. 164) says that the mouthpiece was made from an oil nut, but he is probably in error, for the *ama* nut is too small to have been used in this way.

Triton shell trumpets were usually provided with a band of sennit which served for decoration and also for the attachment of a suspension cord. (See Pl. LXXII, *C.*) A hole was cut in the farthest projection of the lip by sawing a transverse groove in the outer surface of the shell until the channel was reached. A number of small sennit cords were passed through this hole, along the top of the shell, then around the body of the shell a short distance below the apex, and back to the hole again. [284] The separate strands were laid side by side and fastened together at intervals of three or four inches by transverse cords of sennit applied as in simple wrap weaving. There was thus a loop around the apex of the shell and a broad band running longitudinally from the loop to the lip. At either end of the broad band were placed additional lashings from which short loops were made. A long thick cord made from twisted white tapa passed through these loops and served for the suspension of the shell. A tassel, attached just above the lip end of the band, consisted of a number of tresses of human hair which were fastened to strands of sennit in the same manner as in hair ornaments. A tube of human bone, carved into a tiki, was threaded over the sennit cords and concealed all but their inner ends. One of the trumpets examined had been broken and mended with pieces of pearl shell glued on with breadfruit gum.

534 Triton trumpets were highly prized and were used in war and in religious ceremonies. Old specimens are still quite commonly to be found in *me'ae*. According to Handy the Triton trumpet was called *putona*, and the shell itself *vehine na te mano*, "wife of the shark." The maternal uncle of the first child born in a chiefly family announced the event by a blast on a trumpet of this kind.

FLUTES

The Marquesans used both mouth flutes and nose flutes.

The nose flute, called by the natives of Hiva Oa *puhekuheku*, is made from a single joint of bamboo ¾ to 1¼ inches in diameter and 15 to 20 inches long. The upper end of the flute is closed by the septum of the joint, while the lower end is open. The blow hole is in the side of the instrument, immediately below the septum, and the stops in most flutes are placed in the lower half of the tube, in line with the blow hole. (See Pl. LXXIII, *G*.) In historic times the holes appear to have been made by burning with a hot iron. The usual number of stops is two, but some instruments have three and a flute found by Handy in Ua Pou (Pl. LXXIII, *F*) has four stops, two of which are placed a short distance below the blow hole; the other two in the usual position. The lower end of this flute is roughly cut, suggesting that it was originally longer.

[531] In ancient times nose flutes were sometimes decorated with burned designs made with a stone or bone point heated in the fire.

A peculiar nose flute in the Bishop Museum (Pl. LXXIII, *E*) attributed to the Marquesas, is made from a joint of bamboo 22¾ inches long and 1⅝ inches in diameter and is closed at both ends.

Along one side of the flute are five holes, each about ¼ of an inch in diameter. The top hole is close to the septa of the joint while the others are placed at equal intervals. In line with the central hole two others are pierced at equal intervals in the circumference of the tube. The flute is decorated with burned designs of decidedly non-Marquesan character so that its Marquesan origin seems doubtful. It is probably Tongan.

Nose flutes are now obsolete in the Marquesas, and very few persons can play them properly.

In playing, the instrument is held with the edge of the closed end resting against the septum of the nose and the blow hole below and a little distance away from the right nostril. The body of the flute inclines downward and to the right and most of the knack in playing the instrument lies in holding it at the correct angle. The upper end is supported in the left hand, the left nostril being closed by the thumb. The stops are manipulated with the fingers of the right hand. In the Ua Pou specimen the two upper stops must have been played with the left hand. Several of the flutes seen had one of the stops plugged with a wad of coconut fiber, and it is said that a beginner would learn to play well upon one stop before attempting to use more.

The ordinary mouth flute (*puakahau*) (Pl. LXXIII, *D*) is still used throughout the Marquesas. One informant believed that it was not an aboriginal instrument, but if foreign it must have been introduced at an early date.

The mouth flute is made from a long joint of bamboo, rarely over three-quarters of an inch in diameter. The upper end is closed by the septum of the joint. The sound is produced by a tongue about five-sixteenths of an inch wide, made of the inner layers of the bamboo, which acts upon the same principle as the reed of a clarionet. This tongue is placed just below the septum and as it has a tendency to stick, one or two hairs are often drawn across under it at the bottom. There are usually three stops, but in rare instruments four may be present. These stops are placed at equal intervals, the distances between them corresponding to the distance from the lowest stop to the bottom of the flute. The actual distances between stops vary in different flutes, but the regular spacing seems to be a constant feature. In observing the process of manufacture it was noted that the distances were measured by the width of the first two fingers of the right hand. Unlike those of nose flutes the stops of the *puakahau* were always cut (not burned) out. 534

A curious form of *puakahau* (Pl. LXXIII, *C*) for which there seems to have been no special name, was made from two pieces of bamboo one of which fitted accurately inside the other.

The larger piece, which formed the upper end of the flute, was closed, and was provided with a tongue. The stops were cut in the smaller piece. The section bearing the stops could be slid in and out, varying the pitch of the instrument. A flute of this sort was tuned to harmonize with another of ordinary type when the two were to be played together.

Some *puakahau* were made of two, or even three, pieces of bamboo which fitted together closely. Such instruments could not be tuned but they might be taken to pieces and carried in a small space.

Players of the *puakahau*, as of the nose flute, began by mastering one stop before attempting to use more. *Puakahau* are still occasionally used for dances, but in recent times have been employed principally by the men in courting. In former times there are said to have been regular *puakahau* orchestras, composed of as many as twelve men, who were trained to play together. Such orchestras took part in fetes and dances, but it is doubtful whether they were employed in religious ceremonies.

WHISTLES

Bamboo whistles are still used by the children as toys, but they agree so closely with European whistles in shape and principle that it seems doubtful whether they are aboriginal (Pl. LXXIII, *A*). [124] [177]

Whistles are made from a section of bamboo eight to twelve inches long and about one inch in diameter. The lower end is closed by the septum of the joint while the upper end is cut at a long angle and plugged with a piece of wood cut exactly like the plug in an ordinary wooden whistle. A hole is cut in the side of the bamboo just below the inner end of this plug.

The Marquesans occasionally use a hybrid wind instrument, half whistle and half flute, which the natives believe to be aboriginal, but the type appears to be very rare. The upper end of this instrument is identical with that of the whistle, but three stops, like those of the *puakahau*, are cut in the lower part of the tube. In the specimen illustrated (Pl. LXXIII, *B*), two of the three stops have been plugged with cloth.

The following names for flutes have been recorded by Handy, or compiled by him from Dordillon's Dictionary:

Puihu. Nose flute. (D.)
Putetue. Nose flute. (D.)
Ivi tahi. Flute. (D.)
Ia piananai, ia piveuveu. Flute. (D.)
Ki kohe puru. Nose flute. (H.)
Ki. Flute. (H.)
Vivo (Nuku Hiva dialect). Flute with three holes.

JEW'S HARPS

Bamboo's Jew's harps are still used in the Marquesas by boys and young men.

The main part of the harp consists of a strip of bamboo six to eight inches long and about one inch wide. It is split from a large joint, so that it is only slightly curved. A deep narrow notch is cut in the center of one end of this strip; a thin flat strip of bamboo, slightly wider than the notch, serves as a vibrator. This vibrator is not attached to the wider strip, but is laid on its concave surface, covering the notch and protruding two or three inches beyond the end of the wider strip. The instrument is held in the left hand, with the convex side of the wide strip against the mouth. The player blows through the notch, meanwhile striking the projecting end of the narrow strip rapidly with the right hand. Jew's harps seem to have been used only as toys.

STRINGED INSTRUMENTS

The only aboriginal stringed instrument now used in the Marquesas is the musical bow called *utete*. (See Pl. LXXII, *E*). At the present time it is practically obsolete. It was seen only once in the valley of Pua Ma'u, Hiva Oa.

The body of the modern bow is made of fau wood, and is flat on the outer, and convex on the inner surface. An average specimen is three feet six inches long, with a central width of one inch, tapering to ⅝ of an inch at the ends. The string is usually made of slender iron wire, but a very thin cord, twisted from the fibers of the leaf sheath of the coconut palm, is still occasionally used. One end of the cord is twisted around the bow, while its opposite end, which is knotted, is caught in a narrow slot in the wood. To increase the tension, small stones or little pieces of wood, like bridges, are placed under one or both ends of the string. In playing the instrument one end is held in the teeth while the body of the bow projects almost horizontally to the left. The bow is supported by the left hand and the string tapped rapidly with a slender baton made from the midrib of a coconut leaflet. Handy was informed that the bow was made of *mio* and that the string was plucked with the fingers of the right hand.

The musical bow was primarily a woman's toy, but is played by persons of both sexes at the present time. The note is quite faint, being almost inaudible twenty feet away, but being held in the teeth, sounds quite loud to the player.

Dordillon defines the word *kikoua* as a "kind of shell lyre" and *e pukava kikoua* as a "lyre." This would seem to indicate the former existence in the Marquesas of stringed instruments other than the musical bow, but no examples of these have survived, and no information in regard to them was obtained.

STICKS FOR BEATING TIME

At dances the men sometimes beat time with two short sticks. One of the sticks is held in the palm of the left hand and tapped with the other, held in the right hand.

XYLOPHONE

According to Handy, the natives of Nuku Hiya used an instrument called *pahu kou hau* which consisted of ten flat pieces of hau wood resting upon two slender transverse sticks. It was beaten with two sticks held in the hands. This instrument was evidently a primitive xylophone and, if aboriginal, is of considerable interest. 534

COMPARISON

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Two quite distinct types of large drum were used in Polynesia. In Hawaii, the Marquesas, the Society and Cook islands, the drums were tubular, with a skin head, and stood on end; most of them were provided with a pierced base cut in one piece with the body. They were beaten with the hand. In Samoa and Tonga, on the other hand, the large drums were canoe shaped, closed at the ends, but with a long opening cn one side. They were laid on the side, and were beaten with short clubs. In New Zealand, where one might expect tc find the tubular, skin headed drum, the drum was of western Polynesian type. The great wooden gongs of New Zealand appear to have no Polynesian parallel The large tubular drum is unknown in Melanesia, although the principle of this drum is used in small hand instruments. The long slotted drum on the other hand is almost universal. It seems possible, therefore, that the use of the long slotted drum in Samoa and Tonga is due to Fijian influence.

Wooden trumpets appear to have been used in only two Polynesian localities, the Marquesas and New Zealand. The instruments from these regions have little more than the principle in common, however, the Maori examples being much more elaborate. The wooden trumpet does not seem to have been used in Micronesia, and its Melanesian occurrence is limited to a single locality; the interior of northern New Guinea on the Sepik River.

Shell trumpets were used everywhere in Polynesia. In Hawaii the trumpet was made from a species of Cassis, in the Marquesas of both the Cassis and Triton, and in the Society Islands and New Zealand from the Triton. A separate mouth piece was used in the Marquesas, the Society Islands and New Zealand. In Melanesia trumpets made from the Triton shell are almost universal, and a species of Cassis is used in a few localities, but separate mouth pieces appear to be unknown.

The nose flute appears to have been used everywhere in Polynesia except Samoa. Mouth flutes, on the other hand, are found everywhere except in Hawaii, although Krämer believes their presence in Samoa to be due to Fijian or Tongan influence. Cook noted a tunable nose flute in the Society Islands. In Melanesia the nose flute is found in Fiji and in one or two other localities, but it is not common. Mouth flutes are rare in Melanesia, but a type with two holes was used in New Caledonia.

Whistles were used in the Marquesas and in New Zealand. They do not seem to have been used elsewhere in Polynesia.

A Jew's harp practically identical with that found in the Marquesas was used in Hawaii, while a crude form of this instrument also is found in New Zealand. It does not seem to have been used in Western Polynesia. In Melanesia the Jew's harp is important only in the Solomon Islands, but the instrument used there differs so radically from the Marquesan, both in form and method of playing, that relationship seems improbable.

The occurrence of the musical bow in Polynesia seems to have been limited to the Marquesas and Hawaii. The Hawaiian instrument, *ukeke* (Emerson, 72, p. 147), had three strings, and it is possible that the Marquesan "lyres" bore some relation to it. In Melanesia a single stringed musical bow, which was tapped with a stick as in the Marquesas, was used in New Caledonia. A two-stringed bow, quite different in principle from the Hawaiian *ukeke*, was used in the Solomon Islands.

A joint of bamboo slotted along one side, laid on the ground and beaten with two sticks, was used as a musical instrument in Tonga, the Cook Islands and the Society Islands, but was not used in Hawaii or the Marquesas and is naturally lacking in New Zealand. In Melanesia it seems to have been limited to the south coast of New Guinea.

The use of a series of joints of bamboo which were held vertically and beaten upon the ground seems to have been limited, in Polynesia, to Samoa and Tonga. A curious drum made from several joints of bamboo lashed together, the heads covered with matting, seems to have been limited to Samoa. In Polynesia pan pipes of bamboo were limited to Tonga.

Although the distinction between the marginal and western divisions of Polynesian culture is less clearly marked by musical instruments than by houses or stone artifacts, it is possible to distinguish a few features. The large cylindrical drum with a skin head is an element of the eastern or marginal culture; the slotted drum is distinctively western. The reversal of this rule in New Zealand does not seem enough to invalidate the general conclusion. The Jew's harp also appears to be an element of the marginal culture. The wooden trumpet and whistle are limited to New Zealand and the Marquesas. In view of the absence of the nose flute in Samoa it seems possible that this also was originally a feature of the marginal culture and that its presence in Tonga is due to the strong Fijian influence. The slotted bamboo, on the other hand, and the series of joints of bamboo thumped on the ground, appear to be features of the western culture.

CLOTHING AND ORNAMENTS

The climate of the Marquesas is such that clothing is unnecessary as a protection from the cold. The original native dress was a scant costume of tapa. Mats seem also to have been worn but their use was exceptional. The only mention of this custom is by Krusenstern (34, p. 156) who, speaking of the people of Nuku Hiva, says, 291

> Mats are sometimes used among them, and the king's son-in-law, though indeed he was the only person, always came to the ship in one of a very coarse kind, and fastened under the chin in such a manner as to merely cover the back.

In Hiva Oa the natives seem to have no memory of the use of mats as clothing and in view of the tapu which existed on that island against the use by men of mats other than those made of coconut, it seems doubtful that they ever were worn. This tapu was so strong that in former times straw hats which were considered a kind of mat could not be placed on the head without sacrilege. [784]

TAPA

Tapa was made from the bark of several different trees. The most important is the *ute* or paper mulberry (*Broussonetia papyrifera* or *Morus papyrifera*) which yielded a soft white tapa. An inferior greyish tapa was made from the bark of the breadfruit tree, and a strong, mahogany colored tapa, much used in ceremonial costumes, was made from the bark of a species of banyan (*Ficus Sp.*). Jardin (33, pp. 32-59) says that the bark of the *mio* (*Thespesia populnea*) and the *katea* (Alyxia) were also used to a small extent. 287 824

The paper mulberry was essentially a cultivated plant, and was probably introduced by the early settlers. It was planted in fenced enclosures and carefully tended. The breadfruit and banyan do not seem to have been grown specially for tapa making, the bark being obtained from shoots and small limbs. A special form of *ute* tapa, made from the bark of an old tree, was worn as part of a priest's ceremonial costume.

IMPLEMENTS USED IN MAKING TAPA

The implements used by the Marquesans in making tapa were scrapers, beaters and anvils. 287 413

Scrapers

The scrapers used in the manufacture of tapa were made from pearl shells, rarely more than four inches across, whose edges were ground sharp. In some scrapers the irregularities of the hinge were also ground away to make the implement more convenient to hold, but the natural outlines of the shell seem always to have been retained. They must have formerly been very numer-

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ous, for fragments of scrapers may be found in the earth of any village site. A few stone scrapers designed for other purposes may also have been used in tapa making.

BEATERS

The tapa beaters in common use were of two distinct types, the round and the square. There was a third rare type which was intermediate between the two main forms.

The round beaters (Pl. LXXIV, *A*, 3) are simple billets of fau wood, 18 to 20 inches long, cut from saplings 1½ to 2¼ inches in diameter. These billets were stripped of bark, and while still green and soft, were incised from end to end with a number of closely spaced grooves made, it is said, with the corner of a stone adz. They were then allowed to dry, and were ready for use. Beaters of this type have no distinct handles and both ends and all sides may be used. The round beaters were commonly used only for the initial beating of the bark, but could be employed for the entire process of manufacture. A very fine piece of *ute* tapa was seen that had been beaten throughout with an implement of this sort.

The square tapa beaters (Pl. LXXIV, *A*, 1) were made of toa wood (Casuirina) and their manufacture must have required considerable skill and patience. Their handles are said to have been shaped with shells and the grooves cut with sharpened pearl shells or rats' teeth. Beaters of this type were common to the whole of Polynesia, but those from the Marquesas are easily distinguishable by their shorter and heavier grips. The body of the beater is rectangular; the grip is round and nearly as thick as the body. There is a slight flare at the butt of some beaters. Each of the faces is incised with a number of closely spaced longitudinal grooves. The number of grooves on the different faces of a beater varies slightly, but there seems to be no distinction of coarse and fine faces such as is found in the Tahitian and some other beaters. The ornamental designs on beaters which gave the tapa a sort of "water mark," common in Hawaii, seem to have been entirely absent in the Marquesas. A beater with a long slender grip, reminiscent of the Hawaiian and Tahitian forms, was seen in Hiva Oa, and another obtained from an old *me'ae* on the same island, has the grip set at a slight but distinct angle to the body of the beater, a very unusual feature.

Beaters of the third type constitute an ancient form. (See Pl. LXXIV, *A*, 2.) Only two were seen, both of them crudely made. They are made of *toa* wood, are rectangular in cross section, but somewhat more slender than the ordinary square beaters and have no distinct handles. All four faces are grooved for their entire length, but the grooves appear to have been drawn alternately from opposite ends, as some of them overlap slightly in the center of the implement. It seems probable that this form is a hybrid, combining the continuous grooves of the round beaters with the flat surfaces of the square type. 287 413

TAPA ANVILS

The Marquesans employed anvils of both stone and wood. Stone anvils are now little used, but in former times they appear to have been part of the equipment of every household. In early times they were used for only the preliminary beating, but later were occasionally employed for the entire manufacture.

In its simplest form the stone anvil is nothing more than a large flat water-worn bowlder, but most anvils seen have been carefully worked from large blocks of stone. They are rectangular, with a length of from 18 inches to 2 feet, 6 inches; a width of from 8 inches to one foot, and a thickness from 4 to 7 inches. The tops have been carefully flattened and smoothed, the sides made vertical or nearly so. The bottom is usually left rough. Some anvils are widest in the middle, tapering evenly toward either end. An especially fine specimen from Pua Ma'u, Hiva Oa (Pl. LXXIV, *B*) has a longitudinal groove along either side for a short distance below the top and is remarkable in having the bottom more or less hollowed—a feature which may have resulted from its use as a whetstone for stone adzes. These carefully made stone anvils are of considerable interest, as they do not seem to have been used in any other part of Oceania. [324]

Wooden anvils are still used in the manufacture of tapa. The only one seen was made of breadfruit wood, rectangular in cross section, and was approximately two feet long, ten inches wide, and six inches thick. This anvil differs in form from those described by aged informants, and possibly is of a modern and degenerate type. In former times two types of wooden anvils appear to have been employed. The simpler of these was a long straight log, preferably of breadfruit wood, smoothed but not otherwise prepared. The more elaborate type was made from a light colored wood, possibly a species of sandal wood, obtained on the plateau. It was U-shaped in cross section, with straight ends. Its hollowed interior made it more easily portable and increased its resonance so that the sound of cloth beating could be heard for a long distance.

TAPA MAKING

The paper mulberry, from whose bark the best grade of tapa was made, was raised in regular plantations. Handy was informed that dead trees 18 to 20 feet high were cut down and stripped of their bark, that the bark was then soaked, and finally beaten to remove the inner skin. A local informant said that live shoots 10 to 12 feet high were cut and barked while still green, and described the process of tapa making as follows: 287

The fresh bark was taken to a stream, where the coarse outer bark was removed with a shell scraper. The bark was not soaked before the initial beating, a point which was stressed by the informant who was familiar with both the Hawaiian and Marquesan processes of tapa making. The bark was beaten on a stone anvil with a round beater until it was similar to

> 287 paper pulp and in this condition it was very easily injured. This pulp was then wrapped in very large leaves (apparently from a species of Caladium) and taken into the house, where it was kept for two or three days. There was no fixed period for this storage, the time depending upon the condition of the pulp. After this "ripening" the pulp was beaten again with a square beater on a wooden anvil, rinsed in fresh water, and spread out to dry, the edges weighted with stones. The finished tapa was made up in large bundles which were hung from the ridge pole of the house until needed. (See Pl. LXXIV, *C.*)

A slightly different method of making tapa from breadfruit bark is described in a manuscript translated by Handy.

> This account states that the bark was cut with a stone knife, peeled from the branches of a living tree with the teeth, beaten on a stone anvil for a long time, crushed and worked in fresh water, and done up in bundles to ripen. After ripening for four days, the pulp was beaten again on a stone anvil and finally on a wooden anvil.

An informant of Nuka Hiva said that in the final stages of manufacture layers of mulberry and breadfruit bark were frequently laid upon one another and beaten into a single piece, the upper side of which would be of one material, the other side of another. Used tapa was sometimes rebeaten.

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Some of the tapa collected has evidently been oiled, although it is not certain that this was done with the intention of making it waterproof. The Bishop Museum possesses a tapa, ascribed to the Marquesas, one side of which is covered with a dark red glaze, but as there is no other evidence that this process was used in the Marquesas the specimen probably is improperly ascribed. Much white tapa was dyed yellow with a solution of saffron. Jardin (33) says he was told that the natives extracted a blue dye from the leaves of a species of Cordia, and adds: "I have never seen this practice and I have never seen their cloth dyed that color."

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An interesting feature of Marquesan tapa is the use of the watermark of the ordinary grooved beater to produce ornamental effects. One specimen has been beaten with such skill that at first glance it appears to be cloth woven with heavy weft and light warp threads. The ridges and grooves made by the beater extend across it in continuous lines except for a narrow strip along either edge, which is beaten at right angles to the body of the piece, giving the appearance of a border. Another specimen seems to have been beaten with alternate strokes from right and left so that the watermarks cross each other and produce a series of small diamonds. Designs were never painted on Marquesan tapa.

287 The importance of tapa making in the life of the Marquesans is indicated by the many terms in use. The following have been taken from Dordillon's Dictionary:

Akatea. Kind of bush for tapa.
Akatotoo. Kind of mulberry tree for paper. 281
Atea. Tree whose bark was used to make cloth.
Hiapo. Young branch of the Banyan, whose bark is used to make cloth, also the cloth made from this bark. 192
Ike. Tapa beater.
Kokuu. Mallet of wood of this tree (Lily of India).
Kotapa. To even the edges of cloth.
Mapu. Native cloth.
Mata. The right side of pretty cloth.
Nie i te tapa. To equalize the edges of cloth. To cut off the unevenness.
Pahito. Coarsely beaten tapa.
Pahito hitohito. Coarsely beaten tapa.
Pahoa. To beat bark for cloth.
Papo i te tapa. To remake used tapa as new.
Pataka: To peel wood, knocking underneath with a stone or other object.
Peka i te tapa. To beat cloth in cross construction.
Taemani. Said of lustrous, luminous cloth.
Tahotahoki. To beat cloth slowly so that it will be closed.
Tapa kokokoko. Native cloth.
Tapa kookoo. Cloth.
Tapa pia. Clear cloth.
Tapa pokuu. Cloth made from breadfruit bark.
Tihoo. To stretch (a cloth) in beating it, to make it larger and finer.
Tipa. To beat a cloth for the first time.
Titaa. Kind of beater of iron wood.
Titapa. To even the borders of cloth.
Tivaka. To put a length (leaf) in cloth.
Tuaka. Cloth coarsely beaten.
Tapa Tuakahikahi. Clear, thin cloth.
Tumekaka. Cloth poorly beaten.
Tutua. Wood on which tapa is beaten.
Tututini. To rebeat a cloth many times to renovate it.
Ute. A species of tree (*Morus papyrifera*). Bark for tapa. Tapa.
E tapa vakavaka. Strong cloth serving for wrapping.
Uuka. To make cloth into a bundle.

CLOTHING AND BODY DECORATIONS

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The Marquesans rarely went entirely nude although, among the men at least, the practice was not unknown. Quiros (51) says that the first men seen by the Spaniards were nude and Krusenstern (34, pp. 156-159) is specific on this point. He says:

> Even this girdle (the *hami*) is not worn by all the Nukahiwers, for the handsome Mau-ha-u for instance, always effected to go naked; and, although on two occasions I presented him with a girdle, he came on board the next time without it.

Even when entirely nude the Marquesan sense of modesty required that the head of the penis should be covered. The foreskin, which was slit but not removed in the native form of circumcision, was drawn over it and confined by a ligature.

GARMENTS

The simplest form of clothing consisted of a few fau leaves wrapped around the genitals. This was employed by men when working on plantations at some distance from the village. The ordinary male garments were the *hami*, or loin cloth, and the cloak, both made of tapa. The cloak was usually dispensed with when at work. The ordinary *hami* consisted of a single strip of tapa approximately 2 feet wide and 8 feet long which was put on as follows: One end of the strip was passed between the legs, leaving a tail about 18 inches long in front. The rear end was then carried up and around the body to the right, and attached to itself by a few twists in the rear. The front tail was thrust up under the girdle thus formed, its end hanging down on the outside like a short apron. This simple *hami* was amplified in various ways on dress occasions. The commonest modification seems to have been the addition of a tail tied into large knots at equal intervals and long enough to drag on the ground behind. Handy obtained descriptions of two variations: the *hami kohito*, worn by old men, had three pendant strips in front, and a single tail behind; the *hami tatatake* had tails at the sides.

The cloak was made from a large rectangular piece of tapa with its upper corners knotted together. The knot was considered ornamental and was as large as a man's fist. The men's cloak was usually worn with the knot in front, on the breast, so that only the back of the body was covered. When in position its lower edges fell below the knee.

The complete clothing for women consisted of a loin cloth, apparently identical in arrangement with the ordinary man's *hami*, or of a kilt, made from a strip of tapa wrapped several times around the waist and reaching to the knee. A cloak was also worn. Stewart (59, p. 255) says that the younger women frequently wore only the cloak, which was wrapped around the body, the edges held together with the hand. The woman's cloak was identical with that of the men, but might be worn with the knot either on the breast or on one shoulder. According to Handy the festive dress of the women consisted of a strip of tapa as much as thirty or forty meters long which was wrapped round and round the wearer, giving an effect not unlike an European hoop skirt. In some cases it was doubled and plaited around a hoop which hung from the hips. This custom of wearing great quantities of tapa has also been described from Hawaii and the Society Islands. It is rather interesting that the poncho-like upper garment worn in the Society Islands seems to have been unknown in the Marquesas. 291

TATTOOING

The Marquesans surpassed all other Polynesians in the excellence and extent of their tattooing. In men the entire person, even to the crown of the head, was covered with intricate and beautiful designs. Women were tattooed on the arms, legs and shoulders, but not on the body. The facial tattooing of women was limited to a series of short lines on the lips and a small figure behind the lobe of the ear. The present natives deny that the genitals were tattooed, but a drawing in the prospectus of Von den Steinen's book on Marquesan art indicates that this was sometimes done on women. 304

The tattooing was done with bone combs. 304

The larger combs were made from the bones of revenge victims, *heana*, the smaller combs of bird bones. In Hiva Oa at least smaller tattooing combs were made from the bones of tapu birds caught on Fatu Huku. The combs are roughly triangular in outline, with rounded apexes and slightly convex edges. Unfinished specimens show that they were shaped and ground to a sharp edge before the teeth were cut. The cutting of the teeth is said to have been done with a sliver of bamboo. The largest comb collected is about 3 inches long and ½ inch wide at the base, with a maximum width of about ⅓ inch, and a thickness of 1/16th of an inch. The smallest, made of bird bone, is about 2⅓ inches long, with a base width of 1/10 of an inch and a maximum width of about 1/5 of an inch. The teeth range in length from 1/8 to 1/5 of an inch and vary in number from 3 to 18, according to the width of the comb. The lower edge of several of the combs is convex rather than straight so that the incisions made must have been deepest in the middle. This is not a constant feature and was probably accidental. The larger combs were used to fill solid space in the designs, the smaller, in working out curves and details. (See Pl. LXXV, *A*, 2.) 413

According to informants in Hiva Oa, the combs were provided with temporary handles made from joints of upland reed, in which small transverse slots were cut for the insertion of the upper end of the comb. When not in use the handles were discarded and the combs stored in short joints of bamboo (Pl. LXXV, *A*, 3). The complete implement looked like a miniature adz from four to six inches long. In Nuka Hiva a more permanent form of handle seems to have been used, the blade being attached by ornamental lashings of very thin sennit.

The pigment used in tattooing was made from soot or from pulverized charcoal, mixed with water to form a thick ink. 304 386.

In making the soot pigment, which was considered the best, a flat water-worn stone was propped up on three other stones in such a way as to leave a small space beneath it. Three strings of candle nuts, strung on sennit, were then tied together in a bunch, lit, and thrust under

304 386 the flat stone. There were twenty nuts in each string, although the reason for this was unknown to the informant. The soot which collected on the under side of the flat stone was scraped off and packed in a small coconut shell (Pl. LXXV, *A*, 1). To make the charcoal pigment, coconut charcoal was pulverized with a small stone pounder. For this purpose smooth circular pits, common in large stones near villages, are said by natives to have been used as mortars. These pits are so numerous, however, that they must have been used for other purposes as well.

304 In tattooing, the mounted comb was held in the right hand, and a tapping stick of *toa* wood, about one foot long, in the left. A tapa rag was wrapped around the last two fingers of the right hand. The designs to be tattooed were usually drawn on the body in charcoal, but the most experienced artists frequently worked free hand. The comb was dipped in the ink and driven into the skin by a sharp blow from the tapping stick, the coloring matter running down the teeth into the wound. After each stroke the blood was wiped away with the rag.

The body was tattooed in sections, three days being allowed between operations for the healing of the wound. The texture of the skin does not seem to have been greatly altered by the operation, and flesh carving of the sort done by the Maori was unknown. The process was a long and painful one.

The many social and ceremonial observances connected with the tattooing of men, and especially of chiefs' sons, are described by Handy (32). A discussion of the practice of tattooing and of the designs used has been published by Willowdean C. Handy (32 *a*).

MUTILATIONS

The bodily mutilations practiced by the Marquesans were circumcision (32), the piercing of the ears and depilation.

The natives of both sexes pierced the ears for the attachment of ornaments. The operation was performed with a special awl-like instrument. The favorite material for these instruments was human bone, but bird bone and even tortoise shell were sometimes used. Practically all ear piercers were carved at the upper end, the decorations consisting for the most part of conventionalized human faces or figures. (See Pl. LXXV, *B*.) Many specimens have a loop of sennit permanently attached to the upper end, while almost all are drilled for suspension. Such piercers were treasured in families as heirlooms, but seem to have no religious significance.

The ear aperture was somewhat larger than in pierced European ears, being ¼ to ½ of an inch in diameter, but dilation of the ear lobe does not seem to have been practiced. Some of the men's ear ornaments strongly suggest ear plugs, however, and it is possible that dilation of the ear lobe, common in Melanesia, was at one time practiced in the Marquesas. If so, it had become obsolete before the historic period, as it is not mentioned by any of the early writers.

Both sexes removed the pubic and axillary hair by means of tweezers made from the shells of small bivalves. 302

HAIR DRESSING

A number of modes of hair dressing were employed by the Marquesans, the men apparently surpassing the women in the number of styles. Porter says:

> The females at times, on what occasions I do not know, shave their heads close: but I am induced to believe that such occasions are rare, as some wear their hair long, some cut short, and some cropped close, while others are close shaved. They have such variety in wearing their hair that I could not discover any fashion which seemed to prevail over the others. (See 49, pp. 113-114.)
>
> The *pahke* (woman's head dress) consists of a remarkably fine and white piece of paper cloth, of open texture, and much resembles a species of fine gauze, called by us spider's web. This is put on in a very neat and tasty manner and greatly resembles a close cap. The hair is put up gracefully in a knot behind, and the head, when dressed in this manner, bears no slight resemblance to the prevailing fashion of the present day (1812) in America. (See 49, p. 96.) [291]

Porter's observations were made in Nuku Hiva. According to informants in Hiva Oa, women's hair was usually cut off at the shoulders, although it might be allowed to grow full length. On ordinary occasions it was allowed to float free, or was held back from the face by a band of white tapa, with the ends hanging behind. At the time of feasts the hair was drawn up through the *pachaka*, or other ornament worn, and frizzled so that it stood out in small locks. One informant said that these locks were sometimes passed through small corrugated tubes of human bone, of the sort used to decorate container handles.

Men shaved their heads in various ways. Porter says (49, pp. 113-114):

> Their [young men's] custom is to put it up in two knots, one on each side of the head, and they are secured with white strips of cloth, with a degree of neatness and taste which might defy the art of our best hair dressers to equal. The old men wear it sometimes cut short, sometimes the head is shaved, and they occasionally have their heads entirely shaved, except one lock on the crown which is worn loose or put up in a knot. But this latter mode of wearing the hair is only adopted by them when they have a solemn vow, as to revenge the death of a near relative, etc.

When the hair was dressed with two knots the center and back of the head was shaved, the tapa wrapped knots protruding like horns from the bare skull. Gracia (28, p. 134) says that the old men, and especially the high chiefs, wore their hair done up in a single horn on top of the head.

The natives of Hiva Oa seem to have had an even greater variety of styles. Some men never cut their hair, others did it up in two horns, as in Nuku Hiva; still others arranged the crown in fantastic ways, as one half shaved the other long, or the front shaved and the back long, or a series of shaved stripes, with long hair between. Handy was informed that in time of war, finger bones or other trophies of slain enemies were attached to the hair. [727]

302 In pre-European times the head was shaved with a shark's tooth, the hair being gathered in small bunches and the tooth sawn back and forth across it at the roots. Porter (49, p. 114) says that the hair was sometimes singed off with a fire brand. As it was important that the cuttings of the hair should not fall into the hands of an enemy who might use them for malevolent magic, the hair was usually cut in the bed of a stream or on the sea shore. In Atu Ona, Hiva Oa, it was customary for the relatives of a man killed in war to let their hair grow until accounts were squared by the capture of one of the enemy. Their hair was then cut at the public assembly place, the clippings being thrown into a special pit.

Many of the Marquesan men are naturally rather heavily bearded, but practically all are clean shaven or wear only a moustache. A number of methods of arranging the beard were formerly in vogue. Krusenstern (34, pp. 158-159) says the natives of Nuku Hiva usually shaved off their beards except for a small tuft on the chin. In describing the natives of the southern islands of the Marquesas group Fleurieu (23, p. 113) says:

> Those who wear their beards full length, and these are the greatest number, arrange them in different ways. The commonest is to part the beard in two tufts, shaving or plucking the chin, and letting the beard grow on either side. Many others let it all grow and separate it into locks, which they plait, or to which they attach the teeth of fish, human teeth, little pieces of bone, shells, or the colored glass beads which they get from Europeans. Some do not let the middle part grow. Finally, others shave it entirely.

[301] According to Handy the men usually plucked the beard, but many old men would let it grow in order to obtain hair for *pavahina*, ornaments worn on the head. This was usually done for the benefit of some relative, but a man wishing to make a *pavahina* might pay an old man to let his beard grow for the purpose.

Both men and women kept the hair liberally anointed with scented oil (*pani*).

> 303 The oil was obtained by scraping the flesh of an old coconut, wringing it out in a cloth, and adding chopped-up *tiare* flowers and sandal wood, grated by rubbing a piece of the wood, preferably the root, with a rasp made from the tail of the giant ray. The mixture was stirred until the flowers had absorbed all the oil and then left in the sun for three or four days until the oil separated once more. The oil was then drained off and kept in a bamboo, a fau leaf being tied over the open end. Before use, it was diluted with plain coconut oil.

Langsdorff (38, p. 175) describes a somewhat different method of making coconut oil, although it is evident that he refers to the plain oil and not to *pani*. He says:

> They scrape the kernels of a great number of coconuts, which they put upon banana leaves, and let it lie out in the sun for four or five days. They then press the oil from an equal number of fresh coconuts over the scrapings, and let it lie in the sun again for two or three days; by repeating this several times, a quantity of good oil is procured. It is kept for use in the hollow of bamboo canes.

Pani was used only on the hair, the body being anointed with *pao panu*, coconut oil scented with sandalwood. 302

BODY PAINTING

Persons of both sexes painted the entire body yellow, but the use of other colors, or of painted designs, seems to have been unknown. The principal source of the pigment was the root of the turmeric which was cultivated for this purpose. In Hiva Oa this is called *ena*, but Dordillon gives the word *kotohi*, which he translates as "root of turmeric which is planted." The turmeric root was dried, grated, and mixed with coconut oil to form the paint. The natives still stain their faces and hands with the fresh root as a protection against insects. Several other plants seem to have been used for body painting, all of which yielded a yellow dye. Langsdorff (38, p. 114) also says that in Nuku Hiva both sexes painted themselves with the sap of *Thespesia populnea* mixed with coconut oil. Jardin (33, pp. 32-59) says that the juice of *Sinapis nigra* was used to stain the body. He also says that a much prized yellow dye, used for both body painting and tapa dyeing, was obtained from a species of amomum (*Curcuma longa*) which grew in a single locality—a place called Muake in the interior of Nuku Hiva. The roots of this plant were prepared by a secret process and the dye was sold in powdered form. The name which Jardin gives for this plant, *eka*, is the Nuku Hivan equivalent of the Hiva Oan word *ena*, but it seems certain that the *eka* root of Nuku Hiva was not the turmeric (*ena*). It was probably this substance which was an article of trade in ancient times, and which was so highly prized by the natives of Hiva Oa that they sent two large canoes to Nuku Hiva in exchange for it. 302 386 824 [249]

SKIN BLEACHING

White skin was greatly admired by the Marquesans, and it is mentioned as a beauty feature in some of their legends. They had discovered a process for temporarily bleaching the skin, so that immediately after treatment they were almost as light as southern Europeans. The earliest account of the process is given by Langsdorff (38 pp. 113-114), who says: 302

> The manner in which it [bleaching] is done is to rub the whole body with sap extracted from the leaves of three different plants called here *epapha*, *hoko-kuh* and *ohue*. The skin becomes at first entirely black, and for four or five days the person undergoing the operation cannot leave the house; they then wash themselves well with fresh water which takes off the black sap and leaves the skin its natural, nearly white color. [824]

The account obtained by Handy differs somewhat from this. The body, and especially the face, was first painted with *ena* and coconut oil. Over this was smeared the juice from the crushed leaves of the *kokuu* tree or *papa* vine. This gave the skin a green color. The person undergoing the operation stayed in the

302 house for seven or eight days, at the end of which time the skin was bleached. Jardin (33, pp. 32-59) says the natives of Nuku Hiva used the sap of the *niou* (*Siegesbeckia orientalis*) as a skin bleach, rubbing the skin with the crushed leaves the day before a fête.

Skin bleaching seems to have been almost confined to the women, although Stewart (59, pp. 259-260) mentions a male dancer, whose skin had been bleached in this way, who was "almost as fair as any one of our number." The light color produced in this way lasted for only a short time, exposure to the sun causing the skin to reassume its normal brown tint.

SPECIAL COSTUMES

292 Special costumes were worn by priests in the performance of their duties. According to Handy the ceremonial dress of the *ta'ua* of Atu Ona, Hiva Oa, was a full length robe of tapa made from the thick bark of old banyan trees. It covered the whole body and came to the ground, and was likened by the natives to a priest's cassock. It was called *kahu kohito*.

Stewart, writing of Nuku Hiva, says (59, pp. 271-272):

> The Tahunas have a distinctive dress, consisting of a cap formed from a coconut leaf. A part of the stem, six to eight inches in length, is placed perpendicularly over the forehead, and the leaflets still attached to it are passed around the head on each side and neatly fastened together behind. Besides this article on the head, they wear a cape of the same material. In this the stem is split till within an inch or two of one of the ends: it is then passed around the neck so that the extremities rest on each shoulder, and the separated ends are tied together. The ribs running through the leaflets being taken out, they hang gracefully over the chest and back. These articles are usually worn by them on ordinary occasions, and always when in discharge of the services connected with their office.

He describes the dress of a *ta'ua* whom he visited as follows (59, p. 328):

> His whole figure was enveloped in a large mantle of snow white tapa, or native cloth, over which a smaller one of fine scarlet kerseymere fell from his shoulders down the back —both being fastened by one large knot, resting on the chest in front. A double roll of fine white tapa encircled his forehead: while his hair, tied in two close knots, was confined on the crown by long bands of the same.

According to Handy the *taputoho* at Pua Ma'u, Hiva Oa, wore a long cloak of *ute* tapa, like a blanket, which was called *kahu kookoo,* and a peculiar dark colored headdress called *pae kohito*. This headdress was made from the bark of an old *ute* tree which was slightly pounded, and left rough. It was tied around the head and knotted behind with a piece hanging down.

Stewart (59, p. 288) describes the dress of a messenger bearing invitations to a funeral as follows:

> [He] was dressed in a large quantity of white cloth, wearing on his head a bandeau of white with bows, surmounted by a miter shaped cap, formed of the green leaf of a banana

> tree. Besides the fan in his hand, he bore on his shoulder a long pole from which were suspended seven white scarfs, tied into bows at the ends, in a manner similar to those used in our own country. 292

Stewart describes also the dress of two boys who performed at a fête which he attended (59, pp. 259-260):

> One wore on his head the feather helmet and other decorations of the ear and neck of a warrior—the cap being of equal height to all the rest of his figure. About his girdle was a full sash of white cloth tied in a large bow with long ends in front; and from it four white cords of plaited tapa, two behind and two before, descended to the knee—each terminating in monsterous tassels of black hair, fastened to flat circular pieces of wood, whitened with pipe clay. His waist, wrists, and ankles were also hung with the same, and in either hand he held a small tuft of white.
>
> The headdress of the other was a bandeau of white cloth, in a thick roll over the forehead; and above this a wreath of black feathers, surmounted by a high ornament of white tapa gathered into folds at the frontlet, and spreading above into a large cockade in the shape of a peacock's tail—the whole having an airy and tasteful appearance. His necklace was composed of alternate bunches of a brightly shining aromatic vine, and the flowers of the cape jessamine; while his maro, of the purest white, arranged in neat folds, was intertwined with garlands of the same.

Langsdorff (38, p. 172) says that women used green boughs or banana 293
leaves as parasols. Fleuriu states (23, p. 116): "One should count also among their ornaments . . . parasols made of large palm leaves, which they ornament with feathers of different sizes and colors." None of these parasols have survived.

ORNAMENTS

301 The Marquesans compensated for their simple costumes by the use of a great variety of ornaments, ranging from quickly made necklaces and wreaths of ferns and flowers to elaborate headdresses whose manufacture must have required months of work. Certain ornaments were worn exclusively by men or by women, but it is an interesting commentary on the position of the women that many of the most valuable could be worn by either sex. There are some indications of local differences in ornaments, but these are hard to establish at the present time.

FLOWERS, HERBS AND FRUITS

301 824 A great variety of wreaths and garlands, made from ferns and from all sorts of flowers and fragrant herbs, were formerly worn by the Marquesans. This sort of decoration is now limited to wreaths worn on the hair or around the hat.

Most of these wreaths are made from plants chosen for their odor rather than their beauty. The finest are made from *Guttarda speciosa* which bears a creamy yellow tubular flower of wonderful fragrance. The calyxes of the flowers are broken off and the tubes threaded upon a string, the base of one flower entering the mouth of the next. The flowers have a peculiar property of increasing in fragrance as they wither and even when dried have a pungent perfume. At the present time the flowers of *Gardenia tahitensis* are much used for wreaths, although this plant is not native to the Marquesas. The calyxes are broken off, but are left suspended by the pistil. The corollas are then threaded. The finished wreath is a white band from which hangs a fringe of bright green calyxes.

A necklace made from the fragrant ripe fruit of pandanus [*Pandanus odoratissimus*] was formerly a favorite ornament of both men and women.

The fruit looks somewhat like small sweet peppers, with shiny surfaces, bright red at the upper end, shading to lemon yellow at the tip. They were pierced laterally and strung side by side, small ends up, so that they formed a heavy semicircular collar two to three inches wide in the center, tapering toward either end. These ornaments are especially interesting because of their resemblance to a form of wooden gorget. (See p. 429.)

ORNAMENTS MADE OF HAIR

301 Ornaments made from locks of human hair attached to a band of coconut fiber are highly characteristic of the Marquesan culture; nothing at all resembling them seems to have been used elsewhere in Oceania. Although these ornaments vary in size according to the part of the body on which they were to be worn, the technique is always the same.

The band to which the locks were attached was composed of a number of strands of twisted coconut fiber, which were plaited around two heavy longitudinal cords. The method of plaiting was such that at first glance the band seemed to consist of two half-inch ropes, tightly twisted in opposite directions, and fastened side by side. (See Pl. LXXVI, *A*.) The hair was made up into a number of small locks which were attached to the bands separately. These locks were made as follows: A long tress was wrapped at the center with a few turns of fine sennit. It was then doubled back upon itself, and the 301 wrapping continued upward, so that the hair was enclosed in a fiber sleeve about half an inch long. The lock was thus reinforced with sennit at the inner end and terminated in a loop. The separate locks were attached to the band by means of strands of fiber which were separated from one of the cords of the plait, passed through the loop, and twisted into the cord again. The processes of twisting the cords, attaching the locks of hair, and plaiting the band must have been carried on simultaneously, an arrangement which called for a remarkable degree of skill on the part of the workman.

Hair ornaments were made by a special *tuhuna*, who also made featherwork. When an ornament was made for a child the hair was donated by its mother's brothers and father's sisters. For a chief's child all the men in the tribe contributed hair. According to Handy, the hair of revenge victims was also used. The hair was curled, apparently after it had been made up into locks, by wrapping it tightly around small sticks, doing these up in green leaves, and baking them in an earth oven.

Hair ornaments were worn by both men and women on festive occasions.

A complete costume consisted of a large shoulder ornament, one or two waist ornaments, bands on the wrists and above the elbow, and bands on the ankles and just below the knee. The shoulder ornament was worn like an European boa, the longest part resting in the middle of the back while the ends were tied together on the breast and held down by a whale's tooth or other ornament. The waist pieces were worn over the *hami* (loin cloth). When there was only one, it was placed in the rear, like a bustle, when two, one was worn in front and one behind. Plate LXXVI, *A* shows a shoulder ornament; *D*, a waist or shoulder ornament and *E*, a wrist band. The only knee ornament seen was of long wavy hair, like the waist ornament.

Handy gives the following native names for these ornaments: *titi ouoho*, shoulder ornament; *titi ouoho kei*, waist ornament; *poi ima*, arm ornaments; *motutu ouoho*, wrist ornaments; *poi vaivai*, leg ornaments.

BELTS AND ANKLE ORNAMENTS

Edge-Partington (20, p. 48) figures a belt of seven parallel rows of bird 301 bone beads, strung on sennit. Some of the beads are decorated with diagonal incised lines. 237

In Hiva Oa, at least, bands of feather work were sometimes worn around the ankles in place of hair ornaments. No examples of these have been preserved and the information about them is unsatisfactory. They are said to have been made of short black roosters' feathers attached to a broad fiber band. To judge from other feather ornaments they were probably laid on overlapping and pasted to the base.

FINGER ORNAMENTS

Ornaments made from the long tail feathers of the tropic bird were worn by male and female dancers on the second finger of both hands. The ornament

301 287 was made by wrapping the lower ends of the feathers with sennit or inserting them in a short bone cylinder. A sennit loop attached to the ornament was slipped over the finger. (See Pl. LXXVI, *C.*) Dordillon translates the word *kihi* as "ornament of white beard for the fingers." True finger rings seem to have been unknown in ancient times.

BRACELETS AND ARM ORNAMENTS

301 321 The Marquesan shell bracelets are of considerable interest in view of the wide distribution of such ornaments in Melanesia and their comparative rarity in Polynesia. Two examples are shown on Plate LXXVI, *B.* The broader of these is made from the end of a large Conus shell of some sort and is rather crudely finished. The narrower has apparently been ground from Tridacna shell, and is unusually well made. As Tridacna shells of suitable size are lacking or at least very rare in the Marquesas it seems probable that this bracelet was an importation.

In the Peabody Museum at Salem are some very interesting wrist ornaments which were collected during the early nineteenth century. They are of types which have been forgotten by the present natives and the locality in which they were obtained is unknown. Two of these ornaments (Pl. LXXVI, *F*) are made from large blue black seeds, about the size of a small grape, which are attached to a band of plaited coconut fiber identical with that used for hair ornaments. Each seed is punctured at the stem end and attached to a cord of twisted fiber, which is held in place by a small wooden plug. The other ends of these cords are plaited into the band.

824 A still more showy wrist ornament is composed of strings of *Abrus precartorius* seeds. The fiber base is like that used in the ornaments just described, but the seeds are pierced and strung on loops of fine cord whose ends are woven into the band. (Pl. LXXVI, *G.*)

NECKLACES

Necklaces made of a great number of strands of braided human hair were formerly worn by men in the Marquesas. These necklaces, called by Dordillon *takiouoho,* are rare, but there is a very fine specimen in the Peabody Museum at Cambridge and four less perfect ones are in the Peabody Museum at Salem. (See Pl. LXXVII, 1, *A.*) In one specimen (2) the strands of hair seem to have run around the neck continuously; in the others the strands were made into a thick bundle with the ends wrapped with many turns of fine sennit or human hair string. One end of specimen No. 1 is wrapped in such a way that it forms a compact blunt point and the other end is finished with a sort of corrugated cylinder large enough to admit this point. When worn, the pointed end was evidently thrust through the loop and held on the outside with a pin of some sort. Edge-Partington (20, p. 44) shows a specimen with ends finished in this way which has three shell pendants of graduated size. Necklaces with both ends finished alike were tied behind the neck with strings of twisted tapa. (See Nos. 3, 4.) A polished pearl shell was usually suspended from the center of the necklace. 301

Edge-Partington (20, p. 67) figures a hair girdle from Niue which closely resembles these Marquesan necklaces. A necklace of similar form from the Ellice Islands is now in the American Museum of Natural History, and the National Museum has a series of necklaces from Penrhyn Island which differ from the Marquesan forms only in minor details of the finishing of the ends. All these ornaments are obviously similar to the Hawaiian hair necklaces which with a whale ivory hook formed the insignia of chiefly rank.

Necklaces other than those of hair cord seem formerly to have been worn principally by women. They were made from porpoise teeth, shells, or seeds and in later times of European glass beads. The teeth used were perforated as near the bottom of the root as possible, and strung on threads of pineapple fiber. Bead necklaces were usually made of a double strand of beads which was looped back and forth as in chain stitching. The ends of the necklace were tied together at the back of the neck. Combinations of beads and teeth, or of beads and shells, seem to have been rather common. (See Pl. LXXVII, *B*.)

GORGETS AND BREAST ORNAMENTS

The Marquesans used a great variety of gorgets and breast ornaments, most, if not all, of which were worn by the men. The most valued of these was the *ei*, or whale's tooth (Pl. LXXVIII, *A*) some of which at least had a religious significance. As the Marquesans did not catch whales the supply of teeth must have been far below the demand. Porter says that a schooner load of sandal wood could be bought with ten large teeth. Whales' teeth worn as ornaments were drilled transversely near the tip of the root, and were commonly ground at this end, to make them thinner and easier to perforate. In view of their skill in ivory carving it is rather curious that the natives seem not to have carved or shaped these teeth. The tooth was sometimes attached to the ends of a hair ornament worn on the shoulders, serving to weight it down and hold it in position. Most of the specimens seen, however, were attached to ropes of twisted coconut fiber covered with white tapa.

Plaques of large pearl shells were formerly used in the Marquesas, but very few examples have survived. 301

In making the plaque the shell was ground to a more or less regular outline and the colored outer layers removed except for a narrow band around the edge. This band was dec- 321

301 921 orated with a series of closely spaced notches which in one specimen (Pl. LXXVIII, *B*) gives the edge of the shell a toothed appearance. Along the upper margin two or more holes for suspension were made. Shell plaques of this sort seem to have been intended primarily for wear with the necklaces of plaited hair.

Plaques ground from the large end of a species of Conus shell were also used as breast ornaments, but they seem to have been much less common than those of pearl shell.

These plaques were smoothly ground on both sides, the marks of the whorls being almost obliterated. A hole for suspension was drilled near one edge; a few plaques have two holes, drilled opposite each other. These plaques appear to have been worn suspended from necklaces, but no complete specimens were seen. Their occurrence in the Marquesas is of considerable ethnological interest as such ornaments are rare or lacking in other parts of Polynesia but are highly developed in Micronesia.

301 237 Two curious objects of featherwork, one in the Peabody Museum at Salem, the other in the Peabody Museum at Cambridge, are probably to be classed as gorgets. (See Pl. LXXXVIII, *C*, 1.)

These gorgets are made from glossy black cocks' feathers cut to length, those on the upper edge being quite short and those on the lower edge measuring three inches or more. The feathers are laid on in regular overlapping tiers, beginning at one end of the crescent. The exact method of attachment could not be determined, but the feathers seem to have been pasted to a pad of tapa or other soft material in rows and further reinforced by single strands of banana fiber wrapped around the base of each row. The suspension cords are of plaited fau bark. The attachment of the cord at one end is covered by the natural slope of the feathers; the other end is concealed by a sleeve of fine sennit decorated with human hair cord applied in a wrap weave. At the bottom of this sleeve are traces of a band of green and yellow feathers. The dimensions are: length across tips, 9½ inches; maximum width, 2¾ inches; thickness, 1¼ inches.

301 An ornament of large seeds, now in the Peabody Museum at Cambridge, should probably be classed as a gorget, although its construction suggests that of the hair ornaments. The seeds are black and as large as grapes. They are perforated at the stem end and attached to cords of twisted coconut fiber by the method used for seed armlets. They differ, however, in having two seeds attached side by side to the end of each strand. These strands are attached to a band identical with that used in hair ornaments. To either end of this band are fastened long cords of twisted fau bark.

[824] The most characteristic of the Marquesan breast ornaments are the large collars, or gorgets, made from light wood and encrusted with the seeds of the *Abrus precatorius*. One of relatively simple form is shown on Plate LXXVIII, *C*, 2. The base of this ornament is a crescent of soft light wood, cut in a single piece. One side of this crescent was coated with soft breadfruit gum, then covered with the shiny red and black Abrus seeds. Along either side of the encrusted space are glued flat ribbons plaited from strings of white tapa and blackened fau bark. The ends of these ribbons are plaited together to form the

cords for attachment. It is possible that this specimen is a head ornament rather than a gorget, as a somewhat similar ornament is said to have been worn with the great headdress of cocks' feathers.

> Plate LXXVIII, *C*, Nos. 3 and 4, shows two gorgets of more ordinary type. They are composed of a number of sections of light wood strung together by cords running through lateral holes. The cords are concealed except at the ends, where they are braided together to form the tying strings. The usual number of cords seems to be two, but a gorget in the Cambridge Museum has three. Each section of the gorget has a thick inner end and a thin outer end, but the proportions of these parts are variable. In the specimens figured the outer ends are short and flat, but in other gorgets the ends are considerably longer than the thick portion and slope upward toward the outside so that the collar looks dished. In a few gorgets the edges of the collar are cut into tongues or rays. The assembled collars are so rigid as to indicate that the sections were glued together. The incrustation was limited to the thin outer part of the collar. The thick part was whitened with lime or clay.

It is rather curious that the Marquesans should have made a rigid collar of many sections when it would have been much easier to cut it in a single piece. The most plausible explanation for its composite construction seems to be that the idea was borrowed from the necklaces of pandanus fruit which had much the same shape. Krusenstern (34, 156-158) says such collars were the peculiar mark of a priest.

So far as known, seed incrusted ornaments are found only in Polynesia in the Marquesas and Cook Islands. Outside of Polynesia they appear to have been made only in Australia and northern New Guinea.

Necklaces and breast ornaments differing from any of those described are mentioned by some of the early visitors. Langsdorff (38, pp. 170-171) says:

> "Hogs' fangs or pieces of bone, or muscle shells of a particular kind strung together in rows with the threads of the coconut, are very common as necklaces." Fleurieu (23, p. 114) says: "Some are content to carry, hanging from their necks, small pieces of polished bone, of shell, or of white coral or stone which are carved in different figures but which for the most part imitate a large tooth." He also remarks (p. 120) that the women wore collars or necklaces made of black seeds mixed with little shells. Desgraz (15, p. 283) says that small tiki figures of human bones were worn around the neck as amulets. Krusenstern (34, pp. 156-159) says:
>
> "Another sort of gorget is made entirely of boars' teeth fastened onto a band, woven with the fibers of the coconut, and they also wear single boars' teeth, either suspended from their necks, or fastened to their beards, and balls about the size of an apple entirely covered with red beans."

A drawing reproduced by Cook (14, p. 310) shows a string gorget of unusual form, which seems to be made of a great number of short cords doubled over a longitudinal rope. The cords are gathered into bundles just below this rope, the ends hanging free in a deep fringe.

301 According to Handy (32) collars of pearl, called *pipici*, were sometimes placed with a body at burial, and three types of headdress, the *taavaha*, *paekua*, and *hei kua* were sometimes worn around the neck or on the breast.

EAR ORNAMENTS FOR WOMEN

A pair of ear ornaments of rare type are illustrated in Plate LXXIX, *A*, 1, 3. 301 The "S" shaped body of these ornaments is made of a narrow strip of tortoise 321 shell which was softened by heat and bent into shape. At about a third of its length the strip is perforated for the attachment of an ornament composed of porpoise teeth and beads. The teeth are somewhat smaller than those usually used for crowns, but like them are strung on loops of coconut fiber. The beads are, of course, of European manufacture. The long projecting end of the strip was thrust through the lobe of the ear, the body of the ornament hanging below with the toothed portion to the rear. These ornaments were used by women.

The object shown on Plate LXXIX, *A*, 2, may be classed as a woman's ear ornament. Its construction is essentially the same as that of the ornaments just described, but the strip is replaced by a large black seed which has apparently been oiled and polished. The method of wearing this ornament is unknown, but it seems probable that the seed and bead tassel were worn in front of the ear with the teeth behind.

The commonest form of woman's ear ornament, called *taiana* is shown at the bottom of Plate LXXIX, *B*.

The *taiana* is made of two pieces, a cap and a body. The cap, called *puiu*, is made from some white shell, probably Tridacna, and has on the inner side a cylindrical cavity about one-fourth of an inch deep. The sides of this cavity are lined with a thin layer of pith or soft wood. The body consists of a thin strip of human bone whose inner end is finished with a short cylindrical shank. The tip of this shank is cut to accurately fit the cavity in the cap. The rest of the body is decorated with highly conventionalized human figures. A large figure with extended arms is represented in profile at either end, and between these, two smaller figures, shown in front view. The heads of these small figures are supported by the hands of the end figures, while their legs appear at the bottom. Their bodies are not represented. The two ornaments shown at the top of the plate differ considerably from this normal type, but the basic concept is probably the same as the four heads are still recognizable. The inner sides of the ornaments are left rough. The elaborate piercing used in working out the designs is especially interesting as this technique seems not to have been employed in any other Marquesan objects. Ornaments of this sort were worn with carved portion projecting horizontally behind the ear, the cap, which was fitted on the shank, resting against the front of the ear lobe.

The bone of which they were made is said to have been obtained from dead relatives, not, as was the usual practice, from revenge victims. The figures represent ancestors, one of the large figures being male and the other female. Such ornaments were highly prized, and were inherited in the female line.

According to an informant in Fatu Hiva women sometimes wore ornaments similar to the *taiana*, but made from a boar's tusk instead of human bone. Early writers make little or no reference to women's ear ornaments, although they describe those of the men in considerable detail.

EAR ORNAMENTS FOR MEN

The most highly prized of the men's ear ornaments were the *ha'akai* (Dordillon, 17). 301 321

> *Ha'akai* were made from whale ivory in the form of a thick disc from whose rear surface a spur projected. The disc portion was oval, with a flat or slightly rounded outer surface, and was undecorated except for two broad shallow grooves around the edge. The spur was placed near one end of the oval, and was usually made in one piece with the disc. In the specimen shown on the left (Plate LXXIX, *C*), the spur is made from a separate piece of ivory, its base fitting accurately into a cavity in the disc. It is held in place by small plugs of wood and ivory which pass through holes drilled diagonally through both disc and spur. The ends of these plugs are cut flush with the surface of the disc and it is evident that the attachment was permanent. One or two small tiki figures in high relief are carved on the sides of the spur, and in some plugs there is an additional figure at the tip. A hole, parallel to the long axis of the disc, was usually drilled through the spur near its base.
>
> The ornaments were worn with the discs in front of the ear, the spurs passing through holes in the ear lobes and projecting behind. A small wooden plug, thrust through the hole near the base of the spur, kept the ornament in position. The weight of some discs was supported by a band which passed across the top of the head.

Several other types of men's ear ornaments are described by early writers. 301 Stewart (59, pp. 248-249) says:

> In their ears, and entirely concealing them, they wore ornaments of light wood whitened with pipe clay. They are perfectly flat in front, something in the shape of the natural ear, but much larger, and are fastened by running a long projection on the hind part through slits made in the ears for receiving such ornaments.

A portrait of a chief wearing ear ornaments of this type is shown by Cook (14, p. 306). In this figure the discs appear to be in the form of long ovals of rather irregular outline.

An object which probably formed part of an ear ornament of this general type was obtained from a burial cave in Hanamenu, Hiva Oa. It is an oval disc of light wood about 1¾ inches long, 1½ inches wide, and ¼ of an inch thick. In the center there is a small perforation which may have served for the attachment of a spur. Both sides are smoothly finished, and the edge is cut in such a way as to leave a flange on what was probably the outer side.

Krusenstern (34, pp. 157-158) says of the natives of Nuku Hiva:

> They adorn their ears with large white muscles of a circular form, filled with a hard substance like sand, to which a perforated boar's tusk is affixed for the purpose of fastening it to the ear; a small wooden plug passes through the tooth, serving as a clasp to prevent its falling out.

Langsdorff (38, pp. 170-171) says: "A muscle shell of an ounce weight, to which is fastened the fang of a hog somewhat polished, or a light oval piece of breadfruit wood, is the great ear ornament," and Fleurieu (23, p. 114) makes the observation that, "although both men and women have their ears pierced none were seen who habitually wore pendants."

EAR ORNAMENTS WORN BY MEN OR WOMEN

301 The pair of very simple ear ornaments shown on Plate LXXIX, *D* are made from heavy white shell, probably the lip of the Tridacna. One end is carved in imitation of the caps on women's ear ornaments of the *taiana* type. The remainder of the ornament is a simple spur, which, in one specimen, is perforated about midway between the base of the large end and the tip. It has been suggested that these objects were used to keep open freshly perforated holes in the ears.

A number of ear ornaments which appear to be intermediate between the *taiana* and *haakai* types have been preserved. Certain specimens in the American Museum of Natural History are shaped and carved like the spurs of the *haakai*, but are provided at the forward ends with shell caps identical with those used on the *taiana*. A specimen in the Peabody Museum of Harvard University resembles still more closely the spur of a *haakai*. It is made of whale ivory, and has a tiki figure in high relief carved on one side and two smaller figures on the tip. The inner end is blunt and irregular, but there are no indications that it has ever been attached to a disc. It was probably fitted with a shell cap. A specimen in the American Museum of Natural History seems to be a modification of the *haakai* type, but is made from shell. The forward end is worked into a disc considerably larger than the usual shell cap, while the spur is carved with a tiki figure in high relief.

COMPARISON

301
171 The only Marquesan ear ornament for which there is any parallel in the Pacific is that made from tortoise shell, porpoise teeth and beads. This ornament bears some slight resemblance to those worn on the Island of Yap, of which Furness (74, p. 62) says:

> [This] ear ornament is a piece of thin tortoise shell, about a third of an inch wide, bent in the form of a "U"; this is hooked in the lobe of the ear and from the outer ends are suspended little strings of beads.

The more typical Marquesan ornaments of bone, shell and ivory are unlike those used in any other part of Oceania, and must be considered as a local development. The peculiar practice of placing the most highly decorated part of the ornament behind the ear, where it can be seen only on side view, is almost unique.

HEADDRESSES

292
237 A great variety of headdresses were used by the Marquesans. In Nuku Hiva at least the most important of these appears to have been a crest of black cocks' plumes, called *taavaha* or *taavaha pepana* (Handy). A well preserved

ornament of this sort, now in the Peabody Museum of Salem, is shown on Plate LXXX, *A*, 2. 292 237

The ornament consists of two feathered bands, of identical construction, placed side by side and fastened together by wrappings of sennit at intervals of three or four inches. The ends of the bands are enclosed in a longer wrapping; each band consists of a heavy core of twisted coconut fiber over which there is a continuous sennit wrapping. The plumes are closely spaced and have been laid on with their quills against the core, each quill being held in place by two or three turns of the wrapping. Great care was taken to place the plumes so that their natural curve caused those on each half of the band to incline outward and away from the center. Heavy sennit cords, probably a continuation of the fiber in the cores of the bands, spring from either end of the ornament. Other cords of fau bark are attached to the ends of the sennit cords.

The *taavaha* was worn across the forward part of the head, a little back of the forehead, with the plumes rising vertically. The cords at its ends were tied under the chin, like bonnet strings. It was primarily a man's ornament, but was sometimes worn by women dancers at fetes.

Gracia (28, p. 134) says that about 500 feathers were required for a *taavaha*, and that each cock had only two feathers which would serve, so that it was necessary to despoil over 200 cocks to make a single ornament. At the time of his visit a *taavaha* was valued at a gun.

A modified form of the *taavaha* is shown on Plate LXXX, *A*, 1. The bands which form the base of this ornament are like those in the one just described, but the workmanship is not so good. The feathers are much shorter and appear to be cocks' tail coverts. They are made up in small bunches of three to five feathers each, with the quill ends enclosed in short sennit wrappings. The bunches are attached to the cores of the bands by a method resembling that used in attaching the small locks of hair in hair ornaments.

Stewart (59, pp. 247-249) describes still another modification of the *taavaha*. He says:

> It [the headdress] consists of a crescent three or four inches broad at its greatest breadth, fixed uprightly in front, the lower edge following the line of the hair on the forehead, and the points terminating at each temple immediately above the ears. A neat border, an eighth of an inch wide, ran around the edges in a herring bone pattern of alternate black and white—while the middle was entirely filled with the small scarlet berries of the *Abrus precatorius*, fastened upon the material of which it was constructed by a gum which exudes from the breadfruit tree. [Compare this description with the gorget (?) shown on Pl. LXXVIII, *C*, 2.] The crescent formed the front of a cap, fitting closely to the head behind, and the foundation in which the heavy plumage surmounting it is fixed. This plumage consisted of the long black and burnished tail feathers of the cock—the finest I ever saw; those in the center being more than two feet in length. They were arranged behind the front piece as closely as possible, and in such a manner, as to form the shape of a deeply pointed chapeau, placed crosswise on the head—the feathers in the center standing perpendicular, and becoming more and more vertical, till the lowest at the edges drooped deeply over the shoulders. The ends—falling, from the highest point above the forehead, one over another in a regularly defined curve on either side—played in the air with the gracefulness of an ostrich plume, and imparted to the whole an appearance of richness and taste we had not been led to expect from any of the decorations of the country previously seen. [824]

According to Handy a headdress made from the white feathers of the *tuaki* bird was also called *taavaha*.

Gracia (28, p. 134) says: "Oftentimes a bunch of other more curious feathers of sea birds, in the form of a plume, are worn at the top or back of the

292 237 head in addition to the large *taavaha*." This probably refers to ornaments of the same general type as that shown on Plate LXXX, *A*, 3, which were made of unusually long tail feathers of the tropic bird attached to a smooth stick by wrappings of fine sennit. The principle of attachment appears to be much the same as that used in the large *taavaha* except that the plumes entirely surround the stick instead of running only along one side of the band. The lower end of the carefully smoothed stick projects for some distance, suggesting that the ornament was thrust into a coil of hair.

Perhaps the most beautiful of the Marquesan headdresses was the *paekua*, shown on Plate LXXX, *B*. Only two of these ornaments were seen, but these agree so closely in all details of construction and decoration as to suggest that the type was a fixed one. It is rather interesting that one of the specimens contains a few peacock feathers, proving it to be post-European.

The body of the *paekua* is made up of three strips of featherwork. Each strip is broadest in the middle and tapers to a point at either end. A piece of large bamboo, flattened and scraped to paper thinness serves as a base for the featherwork. Over this are laid one or more layers of fine white tapa, which fit the bamboo so closely as to suggest that they were put on while the tapa was wet. The feathers, all of which are small, are glued to this tapa with breadfruit gum. To give additional security the whole strip is wrapped with single strands of some stiff white fiber—probably banana fiber. In a perfect specimen these wrappings are concealed by the feathers, but in the one figured the wrappings, tapa pad, and bamboo base are all visible. The feathers are laid on in irregular overlapping rows, the work progressing from both ends and meeting in the middle.

The tapa pad varies in thickness in the different strips composing the ornament, being heaviest in the top and bottom strips, less heavy on the ends of the central strip, and thinnest at the center of the central strip.

The three strips are pasted side by side upon a single large piece of coconut leaf sheath, whose natural stiffness serves to hold the ornament in shape. Along either edge, outside the strips, run three flat bands, or ribbons, plaited from strands of black dyed fau bark and white tapa. At either end of the ornament, between these bands, is a small triangular piece of white tapa which serves to cover the tips of the strips of feather work. Long tying strips, braided from tapa and black fau bark, are attached to either end of the ornament. In the specimen figured two tapa strings are fastened to the inside near the top center, suggesting that there was originally an additional ornament which projected above the *paekua*.

Green, yellow and red feathers were used. The first two colors were obtained from a species of dove, the *kuku*. The source of the red feathers is doubtful. The usual native story is that they were obtained from the *manu kua*, a red bird long extinct, which lived on the plateaus of Nuku Hiva and Hiva Oa. In an account obtained in Pua Ma'u, Hiva Oa, they are said to have been brought from a far off island called Aotona, which Handy identifies as Rarotonga. A species of *kuku* which has a red cap of the same shade as the feathers in the *paekua* occurs in Hiva Oa, and it seems probable that at least some of the feathers used were obtained from these birds. (It should be noted that Dordillon defines *paekua* as "head ornament of *kuku* feathers.")

The red, green and yellow feathers on each strip were arranged in vertical bands, the center of the middle strip being covered by a large block of red feathers. Two small designs in red, one of which appears in the illustration, were placed on either side of the centers of the outer strips.

The *paekua* is said to have been the ancient headdress of Nuku Hiva and also of the valley of Pua Ma'u in Hiva Oa. It is not mentioned by any of the early writers, however, and probably was always a rare and greatly valued ornament. A narrow band of featherwork, corresponding to one of the three strips in the large *paekua*, was worn as a headdress in Nuku Hiva. It was also called *paekua*. 292 237

According to Handy the *paekua* was worn by young chiefesses at fetes, and was also sometimes worn as a breast ornament. Its principal use, however, was as a man's headdress.

A few other types of feather headdresses seem to have been in use. Forster (25, pp. 15-16) says that some of the natives of Hiva Oa wore "round coronets of the small linguated feathers of the man-of-war bird." Stewart (59, p. 313) says that a *taua* (priest) seen by him in Nuku Hiva wore "a full wreath of red and white feathers, much soiled, in alternate bunches over the forehead and temples." From his notes and from Dordillon's dictionary Handy has compiled names of additional feather ornaments as follows:

Heikua: A wreath of red cock feathers worn by women to dance the *hakapahaka*. The feathers were attached to sennit.

T'ua: An ornament of twelve upright *toake* feathers, which was worn on the forehead.

Hei mekameka: Head ornament of long cocks' plumes.

Kohepea: Long cocks' plumes attached to the end of a stick, worn as an ornament.

Koketata: Aigrette of cocks' plumes on the end of a stick.

Pea: Long tail feathers of a cock. Aigrette of these feathers.

Peue: Head ornament of feathers in the form of a visor.

Tua: Aigrette of red feathers of the tropic bird.

A number of striking headdresses of materials other than feathers were also used by the Marquesans. 292 237

Wreaths or garlands of porpoise teeth (*peue ei*), worn principally by women, are still obtainable, although their manufacture has been discontinued for a number of years. The base of these ornaments is a band plaited from a number of strands of twisted coconut fiber. (See Pl. LXXXII, *A*.) The technique is identical with that employed for the bands of hair ornaments. The band is widest in the middle and tapers toward the ends, which are turned over and plaited back into the band on the outer side, forming stiff loops. Through these loops the tying strings, usually of white tapa, are passed. 321

The teeth were drilled through the root, and were attached as follows: A small bundle of fibers was released from every other cord on one half of the plait, threaded with beads and teeth, and its free end twisted into the corresponding cord on the opposite half of the plait. In almost all specimens both teeth and beads are used, each of the loops having six or more beads at each end and from 10 to 15 teeth in the middle. According to one informant, in ancient times small fish vertebrae were used instead of beads. In one specimen the beads are absent, the entire loop being threaded with teeth. It is evident that the twisting of the cords in the plait, the stringing of the loops, and the plaiting were carried on simultaneously.

In all the specimens examined, the teeth had apparently been drilled with metal tools. The perforations are remarkably small, and the teeth fit the cords on which they are strung so tightly that it is difficult to remove them even when the cords have been broken. Most, if not all, of the teeth used in these wreaths were obtained from the island of Ua Pou. An ordinary wreath contains from 1000 to 1500 teeth, and the demand evidently exceeded the supply, for several wreaths were seen which contained imitation teeth made of bone. A unique specimen, made entirely of bone, is shown on Plate LXXXII, *B*.

When not in use the wreath was straightened and a smooth rod, about half an inch in diameter was run through all the loops, between the teeth and the plaited band. The orna-

292 237 ment was thus held rigid, reducing the danger of breakage. It was then rolled in several thicknesses of tapa. When the teeth in a wreath had become yellow or dirty they were scoured with fine sand.

321 A curious type of headdress (*paekaha*) is shown on Plate LXXXI, *A*. Its manufacture appears to have been limited to Hiva Oa, Tau Ata and Fatu Hiva. It apparently was not made in Ua Pou (Handy) nor in Nuku Hiva, although ornaments of this sort, obtained in trade, were sometimes worn in Nuku Hiva during the early historic period. Some informants of Hiva Oa say that it was not worn in Hiva Oa in ancient times, and ascribe it to Fatu Hiva.

The *paekaha* consists of a number of plaques of shell and tortoise shell which are attached to a band of woven coconut fiber. The warp strands run longitudinally, the weft strands passing back and forth across the band in a wrap weave. The direction of the wrapping is changed at regular intervals, producing an ornamental banded effect. The edges of the band are re-inforced by cords somewhat heavier than the regular warp strands, and its ends are finished in stiff loops. The form and weaving of the band is shown on Plate LXXXI, *C*. The outer surface of the band was originally covered with small discs of mother of pearl about the size of shirt buttons. A small toothed disc of tortoise shell was fastened to the center of each pearl disc. [177] Machine made buttons of china and shell were introduced by the traders at an early time, and soon supplanted the old pearl discs on these headdresses. The ends of the band were covered by pearl shell plates, overlaid with thin openwork strips of tortoise shell. The form and ordinary design of these plates can be seen on Plate LXXXI, *A*. The end plates were called *hana*, the small discs, *hana momo* (Handy).

The plaques, which form the principle part of the ornament, were fastened to the lower edge of the band. There seems to have been no fixed rule as to the number of plaques, but more than seven tortoise shell and eight shell plaques were rarely employed. They were attached to the band by coconut fibers passed through small holes drilled at their tops, and were fastened together near the lower ends in the same way. The shell plaques were made from large conch or Triton shells, and were highly polished on all surfaces. They were made from the lower end of the shell and preserved its natural curve. The tortoise shell plaques were two or three times as wide as the shell plaques, and were elaborately carved. The decoration usually consisted of a large highly conventialized human figure in the center, with panels of superposed smaller figures or designs on either side. A narrow band of designs ran across the lower end. The paces on each side of the head of the large central figure were pierced. In a few specimens the central figure was replaced by two smaller figures, but the examples shown on Plate LXXXI, *A*, *B* may be taken as typical. The most curious feature of this decoration is that, when the ornament was on the head, the figures were all upside down. This lends some support to the statement of one informant that the *paekaha* was originally worn with the plaques above instead of below the band, although all natives agree that in historic times it was worn with the plaques inverted.

The tortoise shell plaques were bent outward at the bottom, their curve conforming roughly to that of the shell plaques. When the ornament was on the head the lower edge flared outward over the eyes, like the visor of a cap. Many of the tortoise shell plaques are perforated at the lower edge, suggesting that small ornaments were suspended from them. An ornament of white beard (*pavahina*) was usually attached to the center of the *paekea* band and projected above it.

The materials used in the *paekaha* were all obtained locally. Two varieties of tortoise shell bearing turtles were distinguished by the natives, the shell of one species being thick and easily worked, and that of the other thin and brittle. No method of cementing the plates together seems to have been known, and the way in which the tortoise shell plaques were bent has been forgotten. Tortoise shell was highly valued by the natives, and the white traders [177] met the demand by importing brown sheet celluloid. Many of the *paekaha* in American col-

lections are of celluloid and the carving on such objects is often superior to that on those of 292
genuine tortoise shell. There are indications that the traders went even further in the 237
paekaha trade, for the plaques in a specimen seen in Pua Ma'u, Hiva Oa, seem to have been 321
stamped in a mold. The material used was apparently vulcanized rubber.

Paekaha were made by special *tuhuna*, and according to Handy were paid for in pigs.
Land was not legal tender in this case, because the *paekaha* was worn on the head, and if a [436]
woman walked on the land given in payment it would be as though she stepped over the head
of the owner of the *paekaha*, a great defilement. The holes in the plaques were made with a [784]
pump drill and the carvings executed, in ancient times, with rats' teeth.

Paekaha were worn by both men and women and in view of the large number preserved in collections it is rather curious that neither Cook nor Fleurieu mention them in their accounts of the southern islands although they speak of other headdresses for whose existence we have little other evidence. This would seem to strengthen the evidence for their Fatu Hivan origin, and it seems probable that they became popular in the other islands of the group only in historic times.

In contrast to this silence in regard to the *paekaha* we have an abundance of early references to another sort of shell and tortoise shell headdress, the *ukihana* (Handy). Cook says (14, p. 309-310):

> Their principle headdress, and what appears to be their chief ornament, is a sort of broad fillet, curiously made of the fibers of the husks of cocoanuts. In the front is fixed a mother of pearl shell wrought round to the size of a tea saucer. Before that another, smaller, of very fine tortoise shell, and perforated in curious figures. Also before and in the center of that, is another round piece of mother of pearl, about the size of half a crown, and before this another piece of perforated tortoise shell the size of a shilling. Beside this decoration in front, some have it also on each side, but in smaller pieces; and all have fixed to them the tail feathers of cocks or tropic birds, which, when the fillet is tied on, stand upright; so that the whole together makes a very sightly ornament.

Plate LXXXI, *C* shows the back of one of these ornaments and the inside of the head band. The bands were plaited in the same way as those of the *paekaha*. The pearl shell, of the largest size available, was ground to a regular outline and drilled near the center with two or more holes for attachment.

A very fine specimen, now in the Peabody Museum of Salem, is shown on Plate LXXXII, *C*. The final disc of tortoise shell is missing—possibly it was never there. The design on the large tortoise shell disc is of the same general type as that illustrated by Cook (14, p. 310). There are indications that two distinct conventions were employed in the carving of these discs.

One convention was characterized by a round disc with elaborate tracery, and an absence of human figures. In the other the disc was oval and from the top center rose two large hooks, with their tips pointing outward. Radiating from the center of the oval were six rather large tiki heads, with the spaces between cut away. Bordering the oval, and joining the tops of the heads, was a continuous band, toothed on the outer edge and delicately pierced and traced. *U'kihana*, in which the oval discs were used, seem usually to have had the ends of the bands covered with plates of mother of pearl and tortoise shell like those used on *paekea*. Those with round discs lacked the plates. It seems probable that these conventions represent local

292 variations, but we have no data as to the locality from which the examples in American museums were collected.
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The construction of the feather ornaments attached to the *uhikana* is clearly shown in Plate LXXXI, *C*.

> The base of the ornament is a straight stick 8 to 10 inches long, and about ½ an inch thick at the bottom and tapering to ¼ inch at the top. This is flattened on the sides. The feathers are laid on with their quills resting against the flat sides, and are held in place by a continuous wrapping of sennit, the work progressing from the top downward. The technique is thus essentially the same as that used in the *taavaha*. The lower ends of the ornaments are inserted between the shell and the band, and attached to the band by loops of sennit.

The *uhikana* was essentially a man's headdress, but does not seem to have been tapu to women. It was worn principally by warriors and dancers, and seems to have been used in all the islands of the group.

A sennit and pearl shell ornament of different type is preserved in the Peabody Museum of Harvard University. The nacre is in the form of small pear-shaped ovals, which are fastened point down upon a sennit band. The band appears to be plaited, and is certainly not woven as are the bands of *paekaha* and *uhikana*.

292 A peculiar object, probably a headdress, is shown on Plate LXXXII, *D*. It is made from small cords of twisted coconut fiber, and consists of a woven band from which hangs three rows of broad flat fringe.

Edge-Partington (20, p. 47) illustrates a head ornament consisting of a sennit band which bears, in the center of the front, a grotesque head, also woven of sennit, with nacre eyes and pointed teeth.

A few other headdresses are mentioned by early writers. Forster (25, pp. 15-16) says:

> "Some wore . . . . a circle from which several ranges of twisted strings of coconut coir about two inches long, either of the natural color or dyed black diverged round the head." Krusenstern (34, pp. 156-159) mentions a headdress made of "a ring of soft wood, from which a row of strings is suspended." An informant in Hiva Oa said that a string headdress called *paeha'a* was used in ancient times, but could give no details of its form. It seems probable that it belonged to one of the types already mentioned.

Fleurieu (23, p. 113) says: "They wear a sort of helmet visor covered with white fabric on which different figures are painted in black."

Aigrettes made from old men's beards were frequently worn with the *peue ei* and *paekaha*, and probably with other ornaments as well. They were called *pavahina*. They seem to have been used in all the islands of the group, and [302] are represented in most museum collections. The beards were usually those of old male relatives, but an old man who was not a relative might be paid to let his beard grow for the purpose. The owner of such an ornament can usually give the name of the man whose beard was used, even when the *pavahina* is several generations old. In spite of the surprising whiteness of the hair in some of these ornaments no method of artificial bleaching seems to have been employed. In almost every specimen there are a few black hairs sprinkled among the white, and rarely tresses of entirely black hair are included. 292

As may be seen from the illustration (Pl. LXXXII, *E*.) the *pavahina* was made up from a great number of locks of hair.

To make one of these locks a long tress of hair was doubled over to form a loop through which a very fine cord of twisted coconut fiber was passed. The loop was then wrapped with a single strand of fiber. The two ends of the cord passing through the loop were twisted together to form a single heavier cord. The tresses, with their attached cords, were then gathered into bundles of from ten to thirty, the ends of the cords in each bundle being fastened together and wrapped with sennit in the same way that the individual tresses were wrapped. A sennit cord, heavier than the cords running to the tresses, was attached to the lower end of the bundle. To complete the ornament, from four to ten of these bundles were placed side by side in two parallel rows, and sewn together with single strands of fiber. The cords depending from the bundles were plaited together to form a flat pad, one-half to three-quarters of an inch long, through the lower edge of which passed a long cord which served for the attachment of the ornament. The method of attaching the *pavahina* to the *peue ei*, and its appearance when in position, are shown on Plate LXXXII, *A*.

Black dyed sennit, or even cords of human hair, were sometimes used instead of ordinary sennit for wrapping the bundles. A crudely made *pavahina*, in which the technique differs somewhat from that described, is shown on Plate LXXXII, *F*.

The pad and bundle wrappings of the *pavahina* were sometimes whitened with lime or clay, and the ornaments are said to have been laid out in the dew for a few nights before a fete to clean and whiten them.

Pavahina appear to have sometimes been worn on the body or limbs with or in place of the hair ornaments described on p. 424. A photograph of an old Nuku Hiva man in full dress shows a half circle of them worn around the chin as a false beard.

Dordillon gives two terms of considerable interest—*pae mamaue*, which he translates "helmet," and *pae veinehae*, which he translates "mask." The existence of these terms appears to be the only evidence for the occurrence of either helmets or masks in the Marquesas.

Dordillon also gives three words for comb: *kofeu*, *paheu* and *pachu*. No Marquesan combs are preserved in American collections, and there are no indications that combs ever formed part of the Marquesan headdress. If they were used in prehistoric times they were probably toilet articles, not ornaments.

Carved bone tubes were sometimes attached to locks of hair as ornaments. These were identical with those used on the fiber handles of containers and on the cords of large drums. 301

301 The tubes were of two types, the simpler of which is shown on Plate LXXXIII, *A*. These simple tubes were made from sections of the smaller human long bones—that is, the radius, ulna and fibula. The spongy interior of the bone was cut out, and the hard surface was decorated with a series of transverse grooves. The tubes range in diameter from ⅜ to ⅝ of an inch, and in length from ⅝ to 1⅛ inches. Tiki figures of human bone, used either as hair ornaments or handle decorations are shown on Plate LXXXIII, *B*. All the specimens examined were made from sections of the shaft of the humerus or femur. In those of the femur the anterior surface of the bone served as the back of the figure, the linea aspera being used as a center line in carving the features. As a result of this, most of the specimens are asymmetrical. Only heads and bodies are represented, and the heads are disproportionately large. The features are conventionalized in the usual Marquesan fashion. The arms are abbreviated, and the hands are shown either on each side of the body, or with the right hand to the mouth—poses common in other Marquesan carvings. The example shown at the extreme right of the plate is unique in having the right hand resting on the right shoulder. These tiki figures are considerably larger than the simple bone tubes, with a length of 1½ to 2 inches and a diameter of 1 to 1¼ inches.

CEREMONIAL OBJECTS

There are a number of Marquesan objects which probably had a religious 778
or ceremonial significance. The most interesting of these is a tapa covered object hewn from a single piece of breadfruit wood (Pl. LXXXIV, *A*) which is listed in the Bishop Museum catalog as an idol.

The lower part or body is in the form of a thin flat tablet. The upper part, or head, juts out sharply from the body in front and protrudes slightly beyond it in the rear. The two sides of the face are slightly concave, meeting in a sharp longitudinal keel. The interior of the head has been roughly hollowed out from the rear, probably to reduce the weight of the object. Two short double pointed sticks of fau wood, only one of which is now in position, were fastened to the back of the head transversely. They were attached with sennit cords which passed through holes in the edges of the object. The body, and the front, top and sides of the head, are covered with ute tapa, which was evidently put on while moist. The back of the head does not seem to have been covered. The tapa is gathered in a knot on the top of the head, and is glued together on the back of the body so skillfully that the joining is hard to detect. The whole object, exclusive of the back of the head, is covered with designs painted in red and black. It is evident that the designs upon the front of the head are intended to represent two large eyes, while bands along the lower edge of the head and on the upper part of the body represent the upper and lower jaws of an open mouth. The spaces around the eyes and inside the mouth, and the front and back of the body, are filled with decorative designs most of which seem to be tattoo designs. The painting was evidently done free hand, and shows considerable skill.

The rough finish of the back of the head in this figure suggests that it was formerly attached to some object in such a way that this part was concealed, but the body of the figure is painted on both sides. Although we have no information as to the use of such figures, it seems possible that they were attached to the beams of houses in *me'ae*, the back of the head resting against the beam and the body hanging below it. Tapa covered bird effigies, painted red, were placed on the ridge pole of the tall pyramidal sacred house at Pua Ma'u, Hiva Oa.

The use of effigies covered with painted tapa in the Marquesas brings to mind the similar Easter Island practice. The figures from the two localities have little more than the principle in common, but in view of the complete absence of such figures elsewhere in Polynesia even this is significant. They are not re- [171]
corded from Micronesia, and even in Melanesia we find no close parallels, except in New Britain where the Baining are said to make huge tapa covered figures thirty feet high (Lewis).

Small wooden figures were probably made by the Marquesans in ancient 778
times, although the few examples known seem to be post-European. There is no 532
definite information as to their use, but they may have been employed for the same purpose as the small stone figures. (See p. 345.) Plate LXXXIV, *B*, shows a modern wooden figure which is interesting chiefly as an example of the breaking down of the old artistic convention under European influence. The proportions of the body and legs, and the modeling of the legs, are much more naturalistic than in the old stone figures. The arms on the other hand, are smaller in proportion to the figure than those of the old statuettes. The head is more nearly in

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proportion to the body and although the old convention is retained for the features, the eyes are smaller and more elongated. It is interesting to note that many of the modern stone figures, which are purely commercial, show the same changes in convention. Those which do not exhibit this modified convention are crudely naturalistic, and no wooden specimen was seen in which the ancient convention has been accurately reproduced.

A curious double statuette, now in the possession of Mme. Mallius of Ta'aoa, Hiva Oa, is shown on Plate LXXXIV, C. It is made of *toa* wood, and has been stained black, apparently by the process used in coloring war clubs. This would indicate a considerable age, although the carving appears to have been done with metal tools. The lengthened leg and disproportionately shortened arm of the degenerate convention are present, but the faces are surprisingly naturalistic. The two figures, which are male and female, were originally joined together at the back, as in practically all Marquesan double figures.

STRING RECORDS

The use of string records seems to have been more highly developed in the Marquesas than in any other part of Polynesia. Such records served principally to aid the memory in the recitations of chants and geneologies, but Stewart (59, p. 335) mentions a time record consisting of a string of tapa in which a knot was tied at the return of every full moon. One complete string record, and part of a second were collected by the Bayard Dominick Expedition.

The complete record, shown on Plate LXXXIV, *E,* obtained in Pua Ma'u, Hiva Oa, has a cylindrical body and is made from rather small three-strand sennit applied in a wrap weave. The warp strands, which run longitudinally, are placed on a slant so that each strand encircles the cylinder once between the upper and lower ends. The upper end tapers to a point and terminates in a loop. At the juncture of this tapering portion with the body of the cylinder there are five small loops of sennit, placed at equal intervals on the circumference, to each of which is attached a small piece of white tapa. The lower end of the cylinder is open, and its edges are finished with sixteen loops of sennit about one inch in length. To two of these loops are attached long sennit cords which were rolled up, when the object was purchased, and thrust into the interior of the cylinder. The cylinder is six inches long and approximately one and three-quarter inches in diameter. After weaving, it seems to have been blackened with earth. This record was used as an aid in singing the *ueuna* (Handy).

Plate LXXXIV, *D,* shows a geneological record. It is considerably larger than *E,* the string record just described, and is stuffed with some soft material.

From the sides spring six long pointed flaps, three above and three below. The knotted cords, which served to keep the record, seem to be attached to the body without regular order and vary considerably in length. The knots are all double, one half of the knot standing for the husband, the other for the wife. The long cords sometimes divide at some distance from the body, and the branches represent other lines of descent.

The string records, according to Von den Steinen (56), were purely mnemonic and could only be interpreted by the maker, or by one whom he had instructed. They were used to record geneologies, and also as an aid in chants of a religious nature. Records of both sorts were sometimes attached to a single body. If the record was in the possession of a family, the father made a knot at the birth of each child, and untied the knot if the child died. When a son married, an additional knot was added for his wife. The woven body of a geneological record was called *too,* signifying the tap root of a tree, and symbolized the history of the gods and the legendary period of the world. The flaps attached to the body are said to symbolize the brothers of the god Atea.

Deaths may also have been recorded by knot records. Von den Steinen says (56, p. 113):

> "I was told that in ancient times, a post, hung with many string records, stood on the western cape of the island of Hiva Oa. There the souls of the dead sprang from a high rock into the sea to begin, submerged, their journey to the ancient home, Havaiki. A priest was delegated to register each death which came to his knowledge with a knot."

211 A number of interesting records for songs and stories are also figured and described by Von den Steinen. One record (56, p. 111-113) has a body in the form of a woven sack, as large as a child's head. The knotted record was attached to the edge of the sack, and when not in use was kept coiled up within it. The sack was kept hung up by a handle in the house of the *tuhuna*, and was supposed to contain a great number of spells and stories, all of which could be related by the aid of the single cord. Another record is very elaborate. It has a short body, covered with white tapa and decorated with plaited coconut leaves and bunches of midribs of coconut leaflets. To this are attached seven cords for songs and twelve for *mata*. All of these were recited in regular order. Still other small records, of the general type shown on Plate LXXXIV, *E*, were used to instruct chiefs' children in chants. One record (56, fig. 5) is woven from fau bark, an unusual material for these objects.

Von den Steinen (56, p. 113) reproduces a drawing by Porter, entitled "God of the Taipis." It is in the form of a human figure, woven from sennit, and from the loops surrounding the top of the head is identifiable as a string record. Von den Steinen says that the use of these records in the Marquesas seems to have been limited to the islands of Tau Ata and Hiva Oa. An incomplete specimen was, however, collected in Fatu Hiva, and the object from Nuku Hiva figured by Porter seems to prove their existence in the northern part of the group.

[illegible] String records were used to keep record of taxes in Hawaii, of songs in the Cook group, and of geneologies in New Zealand.

LOCAL DIFFERENCES IN MATERIAL CULTURE

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Although the material culture of the Marquesas seems to have been nearly uniform, a few local differences are known to have existed. Most of these differences seem to have consisted in a greater or less stressing of features common to the whole culture rather than in a clear-cut absence or presence of traits. In view of the trade and intercourse which are known to have existed in the group even in prehistoric times the survival of such differences seems to indicate that at some former time the local distinctions were still more pronounced. It is difficult at the present time to establish the extent of the local variation. The culture as a whole has broken down under European contact, and since the intertribal wars have ceased there has been a considerable movement of the native population. Ua Huka, in particular, is at present inhabited chiefly by persons born in other parts of the group.

For convenience of reference the local differences in materials and practice may be summarized as follows:

HOUSES

	NUKU HIVA	HIVA OA	FATU HIVA	
House Platforms	Large and well built	Small and less well built	Small and low	[342]
	Wide, some square	Long and narrow	Long and narrow	
	Much cut stone	Cut stone rare	No cut stone	
	Ornamental masonry	No ornamental masonry	No ornamental masonry	
Pit for tapu objects	Common	Absent	Absent	
Ridge Pole	Round	Round or many sided	(?)	
Front Stringer	Round or square	Square or L shaped	Square or L shaped	
Pitch of rear roof	Very steep	Less steep	(?)	
Ornamental lashings	Extensively used	On roof only	(?)	
Carved house posts	Rare or absent	Normal	Common	
Ornamental stone images	Not used	Uncommon	Not used	
Stone back rests	Rare or absent	Common		
Unique features of houses	Bamboo partitions	One grass house		
Opu type of popoi pounder	Not used	Common	Rare	[415]
Salt pounder	Rare	Not used	Not used	
Shape of popoi trough	Short and broad	Long and narrow	Long and narrow	

DRESS AND ORNAMENT

	NUKU HIVA	HIVA OA	FATU HIVA	
Tapa	Combined ute and breadfruit used (rare).	Combined ute and breadfruit not used	(?)	[287]
Tattooing	Designs predominantly angular, small naturalistic figures	Designs predominantly curvilinear, no naturalistic figures	Same as Hiva Oa	[304]
Tattooing Implements	Comb sometimes fixed permanently in handle.	Comb not fixed in handle	Comb not fixed in handle	
Taavaka	Common	Less common	(?)	
Incrusted head ornament	Present	Not recorded	Not recorded	[292]
Paekaha	Not made	Common	Common	

	NUKU HIVA	HIVA OA	FATU HIVA
184 String records	Rare or absent	Common	Common
Wood carving	Inferior	Good	Good

Stone construction, ceremonial structures, sculpture and methods used for the disposal of the dead are reserved for detailed discussion in a report on Marquesan archaeology in preparation.

STONE CONSTRUCTION

	HIVA OA	NUKU HIVA	FATU HIVA
[333] Rough Stone	Smaller stone, poorer construction	Large stone, good construction	Small stone, poor construction
Cut Stone	Rare except in ceremonial structures	Common in structures of all sorts	Rare even in ceremonial structures

CEREMONIAL STRUCTURES

	NUKU HIVA	HIVA OA	FATU HIVA
[346] Tohua	Large, surrounded by platforms	Smaller, platforms on one side only	Small, enclosed by wall, platform on one side only
Me'ae	Platforms like house platforms, small and simple	Many terraces and platforms, large and complex	Smaller than Hiva Oa but complex
Linking of Tohua and Me'ae	Absent	Constant	Constant

SCULPTURE

	NUKU HIVA	HIVA OA	FATU HIVA
532 Wooden Images	Common	Common	Common
Stone Images	Rare	Common	Rare
Relief Carvings	Absent	Common	Rare or absent
Architectural Images	Very rare	Common	Rare or absent
Detached Heads	Very rare	Common	Rare or absent

DISPOSAL OF THE DEAD

	NUKU HIVA	HIVA OA	FATU HIVA
764 Mummification in dwelling	Common	Rare	Normal
Mummification in separate house	Rare	Normal	Rare
Platform for embalming house	Absent	Common on s. side of island, rare on north	Rare
Coffin	Canoe shaped with wood cover	Trough shaped with cover of poles	Trough shaped with cover of poles
Tree burial	Common	Rare	Rare

Except for stone construction, ceremonial structures and sculpture the local differences now ascertainable within the Marquesas are so slight that little can be deduced from them; but they appear to point to a higher development of carving in the southern islands of the group and of stone construction in the northern islands. The blending of these two influences in Hiva Oa produced the high development of stone sculpture on that island.

CONCLUSION

In spite of the large amount of literature dealing with Polynesia, few parts of this vast region have been carefully studied and there is no part for which the information can be considered at all complete. New Zealand is probably the best known locality. Satisfactory, but by no means complete, information is available for Hawaii and Samoa and the present activities of Bishop Museum will contribute additional information regarding Tonga, the Austral Islands and the Marquesas. 121

Accounts of the culture of single localities are chiefly valuable as a basis for the careful comparative study, which alone can throw light on the relations of the various Polynesian groups and ultimately on the larger questions of Polynesian origin and diffusion. The final solution of Polynesian problems can come only from a correlation of the evidence along all lines. Comparative studies based on a single class of evidence—traditions, religion, material culture or physical type—serve to arrange the data in order and make them available for such correlation. Theories based upon such partial studies can only be tentative but are justifiable on the basis of Bacon's dictum that truth can be brought out of error much more readily than out of chaos.

Recent studies of physical type have proved conclusively that the Polynesians are not a pure race but are made up of at least three racial elements (70). These elements are a dolichocephalic negroid race, a dolichocephalic or mesocephalic race which shows Caucasic affinities, and a brachycephalic race with slight Mongoloid affinities which Sullivan calls Indonesian (79, *b*, p. 18). The frequency and distribution of the two non-negroid races seems to indicate that they entered the region in nearly pure form. All three races are present in most of the Polynesian islands but they vary in the proportion which they bear to the total population of each group. The negroid element is strongest in Easter Island but is important in northern New Zealand and is found throughout southeastern Polynesia. The Caucasic element is strongest in northern New Zealand and the Marquesas. The Indonesian element is strongest in Tonga but is important in Samoa, southern New Zealand, Hawaii and the northern Marquesas. 144

Polynesian material culture shows an even more complex condition. The climate and products of all the Polynesian islands except New Zealand are so nearly the same that local difference in culture can not be ascribed to environmental causes, but it is hard to determine which of them are due to differences in the culture of the original settlers of each group. Many of the Polynesian groups are separated from their nearest neighbors by hundreds of miles of open sea and must have originally been settled by very small parties of immigrants. The *tuhuna* system, which placed the more important industries in the hands of 171 101

171 101 a few skilled workmen, was highly developed among the historic Polynesians and when an immigrant group included no *tuhuna* of a given trade, that element of their original culture would tend to be lost or considerably modified. Primitive cultures are not static, and isolated populations come, in time, to have distinctive cultures. The legendary history of Polynesia points to long periods of quiescence and comparative isolation interspersed with periods of great nautical activity. Features which had been developed locally during a period of isolation might be carried to far distant groups during a succeeding period of voyages. The Polynesians were not conservative and it would have been possible for an immigrant group, too small to materially affect the physical type of an inhabited island, to profoundly modify its culture. Even during the periods of quiescence there was probably intermittent contact between the Polynesian islands through the medium of castaways. Some of the involuntary voyages which have occurred in Polynesia during the historic period have covered great distances, and the vagaries of winds and currents have sometimes carried canoes past many intervening islands to landfalls thousands of miles from their starting points. Castaways were usually well received and although they could hardly have brought about any major changes in culture they may very well have introduced single features such as folk tales, superior mechanical appliances, or new forms of ornaments. Western Polynesia was exposed to influences from both Micronesia and Melanesia. There is known to have been considerable contact between Samoa and the Gilbert Islands; and both Samoa and Tonga have been strongly influenced by Fiji.

171 In the preceding chapters of this publication a number of resemblances have been pointed out between the elements of Marquesan material culture and those of other parts of Polynesia. The distribution of the more important cultural traits in the Marquesas, New Zealand, Hawaii, the Society Islands, Samoa and Tonga is shown in the accompanying tables. Traits which are everywhere present in identical form, and traits which are limited to a single locality, have been omitted. The distribution of a few of the more important traits of non-material culture is also shown.

COMPARATIVE TABLE MATERIAL CULTURE

HOUSES

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Platform	Constant, large, rectangular	Absent	Nearly constant, rectangular	Rare in historic times, rectangular	Limited to temples and chiefs' houses, oval	Rare or lacking
Shape	Rectangular	Rectangular or round (South Island)	Rectangular	Oval or rectangular	Oval, nearly round	Oval
Framework	Ridge pole and end posts	Ridge pole and end posts	Ridge pole and end posts or rigid triangle roof support	Indirect ridge pole support or end posts	Three posts together in center and ridge pole; detachable apses	Indirect ridge pole support, end posts not used
Entrance	Side	End	Side or end	Side	Sides of house open	Side
Door	Wooden slide door or mat	Wooden slide door	No door or mat hung in doorway	No door or mat hung in doorway	————	Mat door
Interior	Permanent division into floor and bed	Permanent division into floor and bed	Division into floor and bed common but not constant	No division in historic houses; present in ancient times	No internal division	No internal division
Decoration	Ornamental lashings, posts carved with designs and into Caryatid figures	Posts carved into Caryatid figures, carved panels, woven panels, painted rafters	Rudimentary ornamental lashings, no carved decoration	Ornamental lashings, no carving	Ornamental lashings, no carving	Ornamental lashings, no carving
Furniture	No stools, permanently fixed log pillows, soft pillows	No stools, soft pillows or solid wooden pillows	Stools (rare) soft pillows	Stools, legged pillows	Legged pillows, no stools	Legged pillows, no stools
Houses on posts	(Fata'a) Store house and dwelling for old men; elaborately decorated	(Pataka) Store house for food and tapu objects; elaborately decorated	Men's house, no decoration	Small storage places for sacred objects	No houses on posts	Occurrence of store houses on posts uncertain
Sacred houses	High roofed	No sacred houses except those for instruction, these like dwellings	Like dwellings, also tapa covered pyramidal structures	Like dwellings	Like dwellings	Like dwellings

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COMPARATIVE TABLE MATERIAL CULTURE—Continued

CANOES

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Construction	Five pieces, dugout body, bow and stern pieces, two side planks; plank canoe also used as rare form	Five pieces, dugout body, bow and stern pieces, two side planks; no plank canoes	Five pieces, dugout body, bow and stern pieces, two side planks; plank canoe known	Made of several courses of planks cut to fit together accurately	Made of several courses of planks cut to fit together accurately	Made of several courses of planks cut to fit together accurately
Bow	Long projection, horizontal or slightly curved upward; head carved on outer end	Long horizontal projection; head or figure carved on outer end	No projection, small upturned knob	Long projection, horizontal or curved upward; small figure sometimes carved on outer end	No projection, upper surface decorated with shells and carved knobs; figureheads used in ancient times	No projection or decoration
Stern	High upward curving plank	High upward curving plank	Small upturned knob, no ornament	Whole body of canoe curved upward for some feet	No projection; decorated like bow	No projection or decoration
Seams	Covered with strips inside and out; strips blackened and decorated with white feathers at the lashings	Covered with strips inside and out; strips blackened and decorated with white feathers at the lashings	Not covered with strips	Not covered, outside of canoe rubbed down to give a smooth close joint at seams	Not covered, outside of canoe rubbed down to give a smooth close joint at seams	Not covered, outside of canoe rubbed down to give a smooth close joint at seams
Lashings	Visible both inside and out	Visible both inside and out	Visible inside, almost concealed outside	Invisible outside	Invisible outside	Invisible outside
Decoration	Elaborate carving on bow, stern and side planks	Elaborate carving on bow, stern and side planks, also painting	No decoration	Small figures and other carving on bow and stern	Slight use of carved decoration	No decoration
Double canoe	Two canoes of equal size temporarily connected	Rarely used; two canoes of equal size	Two canoes of equal size	Two canoes of equal size temporarily connected	Canoes of different size permanently connected	Canoes of different size permanently connected
Sail	An inverted triangle with the apex at the foot of the mast	An inverted triangle with the apex at the foot of the mast	An inverted triangle with the apex at the foot of the mast	Modified form of the inverted triangle sail	Inverted triangle sail and lateen sail suspended from the mast head	Lateen sail suspended from the mast head

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COMPARATIVE TABLE MATERIAL CULTURE—Continued

STONE ARTIFACTS

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Tanged adz	Dominant form	Dominant form	Over 90 per cent of all adzes	Dominant form	Rare	Not used
Cross section	Triangular or rectangular	Rectangular, triangular forms rare	Rectangular	Triangular	Triangular	————
Finish	Rough, complete grinding rare	Completely ground, rough finish rare	Rough, complete grinding almost unknown	Complete grinding, rough finish rare	Complete grinding unknown, very crude	Complete grinding normal
Tangless adz	Secondary importance	Secondary importance	Very rare	Rare	Normal type	Only type
Axes	Not used	North Island only	Not used	Found archaeologically, historic use doubtful	Not used	Not used
Melanesian forms	Not found	Present, distribution unknown	Not found	Found archaeologically	Not reported	Many adzes of Fijian form or manufacture
Pounders	Flat and phallic tops, flaring base, tops sometimes carved	Tops round or carved into head, no flaring base	Tops flat, or hemispherical, flaring base	Cross grip with projecting ends, flaring base	No stone pounders	No stone pounders
Pestles	Not found	Present	Common	Common	No stone pestles	No stone pestles
Carved sinkers	Rare	Found on north cape, form closely similar to Marquesan one	Not used	Not found	Not used	Not used
Small figures	Fish and human, common	Human, common on North Island	Fish and human, rather rare	Fish and human, rare	Not used	Not used
Large figures	Common	Rare, limited to localities with tufa deposits	Present but rare, crudely made	Not used	Not used	Not used

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COMPARATIVE TABLE MATERIAL CULTURE—Continued

CONTAINERS

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Boxes	Oval, often bird form, tight cover	Oval, tight cover	Round, tight cover	Present, form unknown	Round, tight cover	No data
Bowls with legs	Not used	Not used	Present but rare	Oval form common	Common	Common

WEAPONS

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Clubs	Paddle club and ax, no bludgeon or throwing club	Characteristic local forms	Short bludgeons, stone headed club (rare); throwing club	Bludgeon, modified paddle club, sickle club, no throwing club	Many types, mostly of Fijian origin, throwing club important	Many types, mostly of Fijian origin, throwing club important
Shark tooth weapons	Knives, no true weapons	Knives, no true weapons	Knives, no true weapons	Many-pronged weapon and sickle	Not used	Not used
Bow	Toy and for fishing	Used traditionally as weapon	Toy and for rat hunting	Used in chief's game	Toy and fishing	Important weapon
Sling	Important	Occasionally used as weapon, also toy	Important	Important	Common	Little used
Sling stone	Double conical	Not shaped	Double conical	Not shaped	No data	No data
Throwing cord	In games only	Stick with cord	Not used	Not used	Not used	Not used
Spear with head cut to break off in wound	Present	Several types	Not used	Not used	Not used	Not used
Chiefs' staves	Important, blade flat, upper end enclosed in woven sleeve, top decorated with hair	Important, blade flat, upper end enclosed in woven sleeve, top carved	Not used	Not used	Not used	Not used
Armor	Not used	Several thicknesses of mats	Thick mats and wicker helmets	Breast plates of heavy fiber, helmets	One-piece suit like Gilbert Islands, very rare	Not used

COMPARATIVE TABLE MATERIAL CULTURE—Continued

MUSICAL INSTRUMENTS

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Shell trumpet	Conch and triton shells, latter with separate mouth piece	Triton shells with separate mouth piece	Conch shells, no separate mouth piece	Triton shells, separate mouth piece	Triton shells, no separate mouth piece	Triton shells, no separate mouth piece
Wooden trumpet	Important	Important	Not used	Not used	Not used	Not used
Drum	Vertical cylindrical with skin head	Canoe shaped, also wooden gongs	Vertical cylindrical with skin head	Vertical cylindrical with skin head	Horizontal slotted	Horizontal slotted
Mouth flute	Important, one form tunable	Important, no tunable form	Not used	Not used	Present but rare	Rare or absent
Nose flute	Important	Present	Important	Important	Not used	Present
Musical bow	Present	Not used	Highly developed, with three strings	No data	Not used	Not used
Jew's harp	Present	Not used	Form identical with Marquesan	No data	Not used	Not used
Slotted bamboo	Not used	Not used	Not used	Important	(?)	Not used
Lengths of bamboo beaten on ground	Not used	Not used	Present	Not used	Important	Present

TOYS

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Stilts	Important	Present	Present but rare	Present	Not used	Not used
Surf board	Present	Present	Important	Present	Present	Not used
Dart throwing	Important	Important	Present	Present	Present	Present
Bowling	Not used	Not used	Important	Not used	Not used	Not used
Coasting	Not used	Children only	Important	Not used	Not used	Not used
Kites	Present	Important	Present	Children only	Not used	Not used
Draft game	Not used	Present	Present	Not used	Not used	Not used

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COMPARATIVE TABLE MATERIAL CULTURE—Continued

DRESS AND ORNAMENT

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Tattooing	Men completely tattooed; women on legs, arms and lips	Men tattooed on face and thighs, body tattoo rare, women on lips and chin	Men sometimes completely tattooed except face	Men tattooed on body and limbs but not on face; women on lower leg and arms, also a girdle	Men tattooed waist to knee; women on arms and legs	Like Samoa
Tapa making	Stone, hollow wooden and solid wooden anvils; square and round beaters, grooves but no water marks	Obsolete, no data on manufacture	Hollow wooden anvil, square and round beater, beaters with water marks or grooves	Hollow wooden anvil; square beater with water marks on one or two sides, other sides grooved	Smooth log, not hollowed, square beater, grooved on three sides, no water marks	Like Samoa
Tapa decoration	Dyed yellow	....	Painted, stamped with bamboo stamps or flowers (rare)	Free hand painting, stamped with flowers or leaves	Free hand painting and painting over carved block	Free hand painting and painting over carved block
Feather work	Feathers pasted on bark; no feather cloaks	Feathers caught into woven fabric; feather cloaks important	Feathers caught into netted fabric; feather cloaks important	Feathers caught into netted fabric; no feather cloaks	Woven in edges of fine mats	No data
Necklaces of many strands of braided hair	Important	Not used	Important, part of chief's insignia	Turban of many strands of braided hair, no necklace	Not used	Not used
Fans	Highly decorated, carried by chiefs	No data	Highly decorated fans sometimes used by chiefs	Elaborate but not ceremonial	Elaborate but not ceremonial	Elaborate but not ceremonial
Fly flap	Not used	Not used	Elaborately decorated feather flaps part of chief's insignia	Elaborately carved, ceremonial (?)	Carried by speaker chiefs	Common, ceremonial (?)

ART

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Carving	High development with application to houses, canoes, tools and utensils	High development with application to houses, canoes, tools and utensils	Poor development, not used on houses, canoes or tools, a few utensils decorated with figures carved in round	Moderate development, applied to canoes and some utensils	Poor development, applied to canoes (crude) and weapons	Poor development, weapons only
Inlay	Not used	Eyes of images only	Eyes of images and a few utensils	Rare or absent	Not used, carved designs on weapons filled with lime	Crude, weapons only
Painting	Practically absent	Applied to rafters, canoes and images	Tapa only	Tapa only	Tapa only	Tapa only
Designs	Curvilinear or angular geometric; spiral predominant; use of conventional faces or figures as decoration; floral and animal forms rare	Curvilinear, angular geometric designs rare; spiral predominant, use of conventional faces or figures as decoration; floral and animal forms rare	Angular geometric designs with a few floral; spiral absent; human or animal forms not used	Angular geometric or circles, no spirals; human and animal figures in tattoo; floral designs on tapa	Angular geometric or floral; spiral rare or lacking; human and animal figures (outline) on weapons	Angular geometric or floral; no spirals; figures rare or lacking
Treatment	Surface divided into zones or sections which are treated separately, occasional superposition of designs	Surface divided into a few large sections or treated as a whole; superposition of designs common	Designs applied in stripes or over whole surface (tapa only), no design superposition	Carved surfaces divided into sections treated separately; tapa surface treated as whole; no design superposition	All surfaces divided into sections treated separately; no design superposition	All surfaces divided into sections treated separately, no design superposition
Human figures	Conventionalized only	Conventionalized and naturalistic	Conventionalized and naturalistic	Conventionalized, very crude	Not used (one doubtful example)	Rare, no data on form

CONVENTIONS OF HUMAN FIGURES

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Leg	Half flexed	Half flexed	Half flexed	Half flexed	———	———
Arms	At sides, hands on abdomen or one hand to mouth	At sides, hands on abdomen or one hand to mouth	At sides, hands on hips. Hand to mouth position not used	At sides, hands on abdomen or one hand to mouth	———	———
Hands	Five fingers of equal length, outer fingers connected by groove behind three inner	Three fingers of equal length	Four fingers when indicated	Five fingers or not indicated	———	———
Body	Formed by a series of planes meeting at well defined angles	Simple treatment, rounded contours	Formed by a series of planes meeting at well defined angles or simple treatment with rounded contours	Formed by a series of planes meeting at well defined angles (not common) or simple treatment with rounded contours	———	———
Mouth	Exaggerated, oval, prominent tongue	Exaggerated, beaked or figure eight form, protruding tongue	Exaggerated, beaked or figure eight form or oval (some naturalistic figures); protruding tongue, common in semi-naturalistic figures	Exaggerated, oval, prominent tongue, or naturalistic mouth	———	———
Nose	Flat, nostril exaggerated	Nostril exaggerated, bridge of nose not shown in many cases	Nostril exaggerated, bridge of nose not shown in some cases	Higher than Marquesan convention and more naturalistic, nostril exaggerated	———	———

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COMPARATIVE TABLE MATERIAL CULTURE—Continued

STONE CONSTRUCTION

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Eye	Broadly oval to round, encircled by raised rim; straight or with slight upward slant	Narrow pointed oval, pronounced upward slant	Narrow pointed oval, pronounced upward slant; also straight eyes (less common)	Pointed oval encircled by raised rim; eye sometimes omitted	———	———
Brows	Exaggerated, high, arched	Exaggerated, high, arched	Exaggerated, high, arched	Exaggerated, high, arched or straight	———	———
Rough stone	Highly developed, wall terrace and platform	A few extensive structures, little or no stone construction in recent times	Highly developed, wall, terrace and platform	Well developed, wall, terrace and platform	Moderate development, wall and platforms. Large ancient structures	Moderate or poor development, wall and platform
Cut stone	Highly developed, rectangular slabs set on edge to face terraces or platforms	Not used	Rare, rectangular slabs set on edge to face terraces or platforms	Highly developed, rectangular slabs set on edge to face platforms, conical forms	Fale o le Fe'e only; stone posts	Highly developed, rectangular slabs set on edge to face platforms and trilithon

MORTUARY PRACTISES

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Mummification	Normal; evisceration by anus and rubbing with coconut oil; in dwelling or special house	Rare in historic times; evisceration by anus, rubbing with oil and smoking, special house	Not practised, temporary preservation by filling body with salt or by varnishing	Normal, evisceration thru incision and rubbing with coconut oil; in special house, anciently in dwelling	Practised by one family only; method like Society Islands	Not practised
Earth burial	Rare, limited to priests and diseased or insane; flexed position (?)	Rare, usually limited to slaves; flexed position	Lower chiefs, some priests, commoners; chiefs and priests extended, commoners usually flexed	Limited to lowest class, flexed position	Normal, extended position	Normal, extended position
Body kept until disintegration	Normal	Normal	Rare; decay hastened by burial and fire	Normal	One family only (see mummification)	Not practised
Disposal of bones	Placed in cave or sacred place; skulls of chiefs preserved	Placed in cave or hollow tree; heads of chiefs sometimes preserved	Kept in dwelling, in special house or in sacred place or placed in caves	Skulls preserved, bones buried in sacred place or put in cave	Skulls of chiefs sometimes kept	———
Vaults	Priests only, form of vault unknown	Not used	Vaults in platforms, priests and lower chiefs (?)	Not used	Rare if present	Stone vaults in mounds (langi) used by all chiefs

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COMPARATIVE TABLE MATERIAL CULTURE—Continued

MISCELLANEOUS FEATURES

	MARQUESAS	NEW ZEALAND	HAWAII	SOCIETY ISLANDS	SAMOA	TONGA
Cannibalism	Highly developed	Highly developed	Absent	Absent	Present traditionally	Introduced from Fiji
Headhunting	Highly developed, skulls of enemies decorated and preserved	Highly developed, heads preserved	Absent	Heads of enemies taken but not preserved	Heads of enemies taken but not preserved	Enemy heads not preserved
Government	Chiefs of little power, power greater in northern islands; no overlords, loose tribal confederacies	Chiefs, no overlords, loose tribal confederacies	Highly organized, chiefs and overlords; large political units	Highly organized, chiefs and overlords, large political units	Tribal organization, confederacies with high chiefs	Highly organized, whole group a political unit
Personal divinity of chiefs	Suggested in northern islands only	Chiefs god descended	Highly developed	Highly developed	Highly developed, speaker chiefs with real power	Highly developed, divine chief with little secular power
Religion	Ancestor worship, great gods known but ignored	Worship of great gods and a host of minor deities, ancestor worship not important	Worship of great gods and ancestor worship	Worship of great gods, family ancestor worship	Village gods embodied in animals, no true ancestor worship	Worship of dead chiefs; great gods secondary
Priesthood	Organized within tribe, inspirational and ceremonial priests	Priest-chiefs and wizards, no regular organization	Highly organized, ceremonial priests important	Highly organized, ceremonial priests important	Priests and priest-chiefs, no regular organization	No organized priesthood, inspirational priests important
Human sacrifice	Highly developed	Common	Highly developed	Less developed than in Hawaii or the Marquesas	Not used	Not used
Sacred structures	Platforms or terraces with temporary houses, large stone enclosures with both secular and religious functions	No permanent sacred structures; sacred house for instruction of young men	Stone enclosures tapu to all but chiefs and priests, also platforms	Stone enclosures with pyramid at one end; commoners admitted to enclosure but pyramid tapu to them.	Village house or small house on platform	House on pyramid containing burial vault
Education	Organized instruction for both men and women in special house	Organized instruction for young men in special house	No organized instruction	No organized instruction	No organized instruction	No organized instruction

171 174 It can be seen from the tables that Samoa and Tonga show a closer cultural agreement than any other two Polynesian localities. The Marquesas and New Zealand show an almost equally close agreement. The Society Island culture occupies an intermediate position with numerous resemblances to both the Samoan-Tongan and Maori-Marquesan cultures. The Hawaiian culture resembles the Maori and Marquesan on the material side, but its non-material features are more closely related to those of the Society Islands and western Polynesia.

The Maori and Marquesan cultures show so many similarities that, in the absence of historic contact, they must be considered as not very divergent developments of a single ancestral culture. The content of the various New Zealand culture areas outlined by Skinner (78) has not yet been established, but most of the traits common to New Zealand and the Marquesas seem either to have been limited to the north island or to have been much more highly developed there. According to Maori traditions the north islanders were descendents of immigrants who came to New Zealand from Tahiti and the Cook Islands in the twelfth century (Smith, 79, p. 223). The traditions of the southern Marquesans indicate migration from Tahiti and the Cook Islands, and mention groups still farther to the west. It seems practically certain, therefore, that a culture similar to the historic Maori and Marquesan cultures formerly existed in southeastern Polynesia.

The Maori and Marquesan cultures differ from the Samoan and Tongan cultures in so many respects that the two complexes must have been largely derived from different sources. The original cultures of Samoa and Tonga probably differed considerably from the historic ones. Cannibalism and the use of the bow as a weapon in Tonga, and the elaborate club forms of both Tonga and Samoa were due to Fijian influence. The Samoans ascribe the introduction of tapa making to a Fijian chief and their tapa making implements are almost identical with the Fijian ones. The slotted drum was almost certainly borrowed from Fiji. Legged pillows were probably borrowed from Fiji, where the form of the coiffure made them necessary. Legged utensils may also have been borrowed as such utensils are more numerous and of more diverse form in Fiji than in either Samoa or Tonga. Even the use of round or oval houses may not have been a feature of the original Samoan-Tongan cultures for round houses are practically absent in Indonesia and Micronesia but are found in both Fiji and New Caledonia.

The western Polynesian cultures have many features in common with Micronesia. The resemblances seem to be more marked in the Caroline and Marshall groups than in the Gilbert Islands. Micronesia is still too imperfectly known to permit of detailed comparison, but the Caroline and Marshall cultures have in common with the Samoan-Tongan culture a considerable development of chiefly power with a tendency toward fixed social classes; extended earth burial, often with orientation; the use of many piece canoes and lateen sails; and a high development of mat weaving with the use of mats for clothing. Many other features of the Samoan-Tongan culture are also found in Micronesia but are less universal in their occurrence. Although it is possible that these features were borrowed from Micronesia by the western Polynesians, it seems more probable that the original culture of the Samoans and Tongans was essentially Micronesian in type. 171 174

The affiliations of the Hawaiian culture are difficult to establish. The Hawaiian culture resembles the Maori and Marquesan cultures in the form and internal arrangement of houses; canoe structure and sail; use of the stone pounder and tanged adz; stilts and surf board; in the use of human effigies and in the conventions applied to them; also in the rarity of utensils with legs and absence of legged pillows. It shares with the Marquesas the use of stone house platforms; extensive ceremonial structures of stone; a pounder with a flaring base; prepared sling stones; the musical bow; the large vertical drum with a skin head; and necklaces made from many strands of plaited human hair. These features are lacking in New Zealand. The Hawaiian culture also has a few features in common with the Society Islands which are lacking in the Marquesas. The most important of these are an organized priesthood; a centralized government with divine chiefs; and the use of netted featherwork, helmets, flyflaps, painted tapa decoration and watermarked tapa beaters. Many voyages between Hawaii and the Society Islands were made from 1100 to 1300 A.D. (Smith, 79 *a*, p. 223) and according to Hawaiian traditions the use of enclosed religious structures, the vertical drum, human sacrifice, increased centralization in government and a stronger organization of the priesthood were introduced into Hawaii at that time. It is impossible to tell whether the other similarities of the Hawaiian and southeastern Polynesian cultures are due to this relatively late contact, but it seems probable that those features which show a very close agreement—such as netted featherwork, tapa painting, watermarked beaters and the conventions employed for human effigies—were brought to Hawaii by the southern immigrants. The similarities in canoes, houses and stone implements, on the other hand, are probably more ancient and point either to an earlier contact or to the partial derivation of both the Hawaiian and southeastern Polynesian cultures from the same source. The main features which distinguish the Hawaiian culture from the Maori and Marquesan cultures are the high social and religious organization of the Hawaiians and the absence in Hawaii of cannibalism, head

171 174 hunting, organized instruction for young men, curvilinear art and decorative carving. Stone construction was also highly developed in Hawaii although practically absent in New Zealand. If those features which were probably introduced into Hawaii from southeastern Polynesia in comparatively recent times are eliminated, the residual Hawaiian culture is intermediate between the Maori-Marquesan and Samoan-Tongan cultures but seems to be most closely related to the Maori-Marquesan cultures.

The Marquesas and Hawaii have several features in common which are lacking in New Zealand. Although the historic culture of all the Marquesan islands was nearly the same, decorative carving and curvilinear art seem to have been more highly developed in the southern islands of the group, while stone construction was more highly developed in the northern islands. The northern islands also showed an increased tendency toward centralized government and toward a belief in the divinity of chiefs. The resemblance of the Marquesan culture to that of Hawaii was thus more marked in the northern than in the southern islands of the group. The southern islands are more desirable for settlement and lie nearer to the Society group so that immigrants from southeastern Polynesia would be likely to encounter them first. The traditions of the southern Marquesans indicate that they did not reach the group until about 1000 A.D. (Handy, personal correspondence). It seems probable, therefore, that the historic culture of the Marquesas was a blend between an original culture somewhat like that of the early Hawaiians and a Maori like culture which entered the group from Southeastern Polynesia at some later time.

The Society Island culture is intermediate in many respects between the Maori-Marquesan and Samoan-Tongan cultures. As it is almost certain that cultures similar to the Maori and Marquesan ones formerly existed in southeastern Polynesia it seems probable that the Society Island culture is a blend between an early culture of Maori-Marquesan type and a culture of western Polynesian type. Society Island culture shows a few distinctive features, the most important of which are an organized priesthood and a considerable centralization of government with suggestions of a feudal system. The historic Samoan-Tongan culture shows a tendency toward centralized government and it seems probable that the distinctive features of the Society Island culture originated in the Society Islands as a result of the contact of immigrants from western Polynesia with a subject population.

It is possible to distinguish three main types of culture in Polynesia. These cultural types correspond in a general way with the culture areas distinguishable in other parts of the world, but their historic distribution was not geographically continuous. One type of culture, linked with populations pre-

dominantly Indonesian, centered in western Polynesia. A second type seems to 171
have centered in southeastern Polynesia, associated with people predominantly
Caucasic, but who showed considerable negroid admixture. This type survived into 174
historic times in the Marquesas and New Zealand but had been greatly modified in the Society Islands by immigrants with a culture of western Polynesian type. A third culture, associated with populations of mixed Indonesian and Caucasic type with little negroid admixture, formerly existed in Hawaii and the Marquesas, but had been modified or displaced in the Marquesas by immigrants with a culture of southeastern Polynesian type. Two of the cultural types are, therefore, linked with mixed populations and have either been introduced into Polynesia by mixed groups of immigrants or have been developed from the fusion in Polynesia of races dissimilar in physical type and probably in culture. The evident correlation between culture and physical type in Polynesia points to a relatively recent settlement of the region.

The Samoan and Tongan cultures apparently are not hybrids produced by the complete fusion of originally distinct cultures. They are rather to be considered as developments of a single comparatively simple culture which has been modified by borrowing from several sources. This culture seems to have been characterized by the use of rectangular houses or houses with a rectangular center and apses, many piece canoes and lateen sails; bludgeon clubs and possibly throwing clubs; a high development of mat weaving with a use of fine mats as clothing; an angular geometric art with a poor development of wood carving and a rarity or absence of human effigies; a moderate development of stone construction, extended earth burial for commoners and vault burial for chiefs; a tendency toward centralized government with divine chiefs and social classes; elaborate geneologies, and a worship of gods or dead chiefs. The Samoans and Tongans appear to be racially more homogeneous than the inhabitants of any of the other large Polynesian groups and are predominantly brachycephalic (Dixon, 70 *a*, Pl. XXII-XXV), with a large proportion of the Indonesian race (79 *b*, p. 19). It seems probable, therefore, that the culture just outlined was introduced into Polynesia by immigrants of Indonesian race.

The Maori and Marquesan cultures, which seem to be the historic representatives of the old southeastern Polynesian type of culture, show a number of Melanesian affinities. Maori art resembles that of the Massim region of New Guinea and that of some parts of New Britain, New Ireland and the Solomon Islands much more than it does that of western Polynesia. The five-piece type of canoe construction was used in most of the Melanesian localities where the natives built large craft and the highly decorated bows and sterns of the Maori and Marquesan canoes are suggestive of some Melanesian forms. Cannibalism, 171 174 head hunting, preservation of the skulls of ancestors, exposure or preservation of corpses, instruction or initiation of young men, absence of large governmental units and chiefs of little power are all of wide occurrence in Melanesia although lacking in western Polynesia. In spite of the general Melanesian tone of the Maori and Marquesan cultures, analysis shows that they are not closely linked with the culture of any one Melanesian locality. The art resemblances are general rather than specific and the Maori-Marquesan image conventions are practically absent in Melanesia. The non-material traits common to the Maori-Marquesan and Melanesian cultures are of very wide occurrence in Melanesia and are present in cultures which differ considerably on the material side. Single traits of the Maori and Marquesan material cultures are often present in one or two of the Melanesian cultures but the distribution of these traits is so irregular that little can be deduced from it.

171 174 144 Both the culture and physical type of the northern Maori and southern Marquesans indicate that their ancestors had been in contact with some negroid people. It has generally been assumed that this contact occurred in the course of their migration from Indonesia and that the Melanesian elements present in Polynesia reached that region as inclusions in some non-negroid race. Churchill (69, p. 139) advances the theory that the Polynesian immigrants coasted along Melanesia and made many stops to rest and raise crops, in this way coming into close contact with the negroid peoples of the region. The northern Maori and southern Marquesans are predominantly of the Caucasic race and if this race came by way of Melanesia and picked up negroid blood and Melanesian cultural traits in transit, we should expect to find negroid blood and Melanesian traits in all the groups where the Caucasic element is important. It is important in Hawaii, where there is very little of the negroid element (Sullivan, 79, *b*, p. 19) and where the culture shows hardly any Melanesian affinities. It seems probable, therefore, that at least some of the Caucasic immigrants into Polynesia had had little or no contact with Melanesians at the time of their arrival. The population of Easter Island, which lies on the extreme eastern edge of Polynesia, shows a larger proportion of negroid types than that of any other Polynesian locality (Dixon, 70, *a*, p. 370). Stone implements which are of Melanesian type and which differ considerably from those used by the historic population have been found in Tahiti. It seems improbable that a racial element which entered Polynesia as an inclusion would have retained its distinctive implement types or would have been strong enough to dominate physically in the easternmost Polynesian island thousands of miles from Melanesia. It is more probable that the population of central and southeastern Polynesia was at one time predominantly negroid in physical type and Melanesian rather than Polynesian in culture.

The southeastern Polynesian type of culture probably originated in central 171
and southeastern Polynesia through the fusion in that region of an early negroid
population with immigrants of the Caucasic race. The cultures of these two 174
races no doubt differed considerably but it is almost impossible to tell which of the features present in the resulting culture are referable to the negroids and which to the Caucasic immigrants. The presence of a feature of the southeastern Polynesian culture in Melanesia is not sufficient evidence for its ascription to the negroid population, for the Caucasic people probably reached Melanesia as well as Polynesia. The contact of two cultures which are not too widely separated in the scale of development is stimulating to both. Ideas and appliances are borrowed back and forth and worked over to conform to the pattern of the borrowing culture. When dissimilar cultures fuse, the resulting complex is comparable to a chemical rather than a mechanical mixture. Some features of the original cultures may survive with little change but others will be greatly modified and new features may arise which can not be directly traced to either of the ancestral cultures. In view of the general situation in Melanesia and Polynesia the following traits may be tentatively ascribed to the culture of the negroid stratum in the Polynesian population:

Round, oval or canoe shaped houses, five piece canoes with decorated bows and sterns, axes and smoothly ground tangless adzes, staves and sickle or pick clubs, the throwing cord, curvilinear art, cannibalism, spirit worship, initiation or instruction for young men.

The culture of the Caucasic immigrants seems to have been characterized by the use of rectangular houses with permanent beds, special houses on posts, five-piece canoes, double canoes, triangular sails, partially ground angular tanged adzes, stone pounds, stilts, kites, human effigies, stone construction, exposure or preservation of corpses with flexed burial for the very poor or diseased, preservation of skulls of ancestors, head hunting and ancestor worship.

The blending of these two cultures produced a hybrid culture which was richer than either of its parents. There was a considerable improvement of technical processes and a remarkable efflorescence of art. Several new features of material culture seem to have been developed. Among these were the use of wooden slide doors in dwellings, a characteristic form of canoe decoration, fully ground angular tanged adzes, small stone effigies, shell trumpets with separate mouth pieces, wooden trumpets, oval boxes with tight fitting covers, rigid conventions in the pose of human effigies, and probably the practise of mummifying corpses by evisceration and long continued rubbing with oil.

The Hawaiian culture resembles the southeastern Polynesian culture in some respects but lacks most of the features which, because of their wide oc-

171 174 currence in Melanesia, are probably referable to the negroid stratum in the southeastern Polynesian population. It also has several features in common with the western Polynesian culture. It seems probable, therefore, that it is a blend between a culture of western Polynesian type and the culture of the Caucasic immigrants who mixed with negroids to produce the southeastern Polynesian culture. The historic Hawaiians are predominantly brachycephalic but Sullivan concludes that they are a thorough mixture of the Caucasic and Indonesian races.

171 174 144 Each of the three races present in Polynesia probably entered the region at a different time and brought with it a distinctive culture but it is still impossible to establish their chronological sequence. The negroid race was probably the first to arrive in central and southeastern Polynesia. The main argument which has been advanced against the presence of a negroid population in this region has been the supposed inability of negroid peoples to make the long voyages necessary to colonize Polynesia. It is improbable that a race able to reach Fiji from the New Hebrides, the nearest Melanesian group to the west, would have been unable to cross the shorter stretch of sea separating Fiji from Tonga or to make the only slightly longer trip from Fiji to Samoa. The central and southeastern Polynesian groups are comparatively close lying and it would not have been difficult for even poor navigators to pass along them as far east as the Austral and Tuamotu Islands. It is not necessary to suppose that the migration of the negroid race was a deliberate or organized movement. It is probable that, like the historic Melanesians, they disliked long voyages but their presence in Fiji proves that they had seaworthy vessels and it would always be possible for a canoe to be blown out of its course and carried to islands unknown before. There is no indication that a pure negroid race reached Hawaii and the negroids probably did not reach New Zealand or the Marquesas except as inclusions in some superior race.

The order of arrival in Polynesia of the Caucasic and Indonesian races must be left an open question. The traditional movements in Polynesia have been from west to east and from southeastern Polynesia to Hawaii, the Marquesas and New Zealand. As the Indonesian stock seems to be strongest in western Polynesia this may indicate that it was the last to arrive. At the same time, the Indonesian element in the populations of New Zealand and the Marquesas seems to be strongest in those localities which are least desirable for settlement and which are farthest from the probable points of arrival of immigrants from the rest of Polynesia. In New Zealand and the Marquesas, therefore, the Indonesian race may have preceded the Caucasic race. It seems probable that the sequence of arrival of the three races in central and southeastern Polynesia was first, Negroid; second, Caucasic; third, Indonesian. The priority

of the Indonesian race in the more distant Polynesian localities may have been 171
due to their greater skill as navigators. The use of many piece canoes and
lateen sails, which was apparently a feature of the Indonesian culture, gave them 144
a freedom of movement which the negroid and Caucasic races probably lacked. 174
Polynesian traditions mention long voyages of exploration and the sailing canoes of the Tongans carried complements of over a hundred men and were hardly more dependant upon winds and currents than European sailing vessels. It would not be difficult for a race which used such canoes to pass by islands which were held by hostile populations and establish itself in more distant islands which it found unoccupied or sparsely settled. The Indonesian race may have colonized both western and marginal Polynesia before it succeeded in conquering the large mountainous islands of southeastern Polynesia. The establishment of cultures of western Polynesian type in southeastern Polynesia must be quite recent for cultures of Maori-Marquesan type were still in existence there at the time of the twelfth century migration to New Zealand.

The routes by which the negroid, Caucasic and Indonesian races reached Polynesia can not be fully established until we have fuller information on Micronesia and Melanesia. The historic distribution of races and cultures in Polynesia seems to be best explained by the following hypothesis: The first settlers of central and southeastern Polynesia were negroid in race and Melanesian rather than Polynesian in culture. They entered the region largely as a result of accidental drifts and settled in Tonga, Samoa, and the Cook, Society, Austral and Tuamotu groups, but did not reach any of the more distant Polynesian localities. They came originally from Melanesia, probably from Fiji. The next immigrants to reach Polynesia were of the Caucasic race and had come from Indonesia by way of Micronesia. They arrived first in Samoa and spread over the territory held by the negroid people, mixing with them to produce a hybrid race and the southeastern Polynesian type of culture. A fairly pure group of the Caucasic race reached and colonized the Marquesas, which they found unoccupied or only partially settled by the negroids. A mixed group, in which the negroid element predominated, reached Easter Island. The Caucasic immigrants did not, at this time, reach either Hawaii or New Zealand. While the main body of the Caucasic immigrants were passing through Micronesia another group of the same race were coasting southward through Melanesia. This wing of the Caucasic migration was probably absorbed or dissipated before it reached Polynesia but it modified the culture of the eastern Melanesian islands to a considerable degree. The last immigrants to enter Polynesia in large numbers were of the Indonesian race. They came from Indonesia, like the Caucasic immigrants, and passed by way of Micronesia. In Micronesia their

171 174 144 vanguard met and mixed with the rearguard of the Caucasic immigrants and a group of this mixed people sailed eastward, perhaps from the Marshall group, and discovered and colonized Hawaii. The main body of the Indonesian invaders arrived first in western Polynesia and established themselves most thoroughly in Tonga, where the islands were comparatively small and level. In Samoa, where the islands were large and mountainous, the earlier Caucasic and negroid population held out for a considerable time and was able to somewhat modify the culture and physical type of the conquerors. In Niue, an isolated group of the earlier population survived into historic times. The Indonesians sailed southward from western Polynesia and discovered and colonized New Zealand. They also spread over southeastern Polynesia and reached the Marquesas. In that group they mixed with the earlier Caucasic population producing a culture somewhat like that which had been carried to Hawaii by immigrants of mixed Caucasic and Indonesian race. They were unable to displace the mixed Caucasic and negroid populations of the larger southeastern Polynesian islands but they established colonies on these islands. This first Indonesian invasion was followed by a period of comparative quiescence during which few voyages were made. About the year 1000 A.D. (79, *a*, p. 223) a second period of voyages commenced. It is impossible to tell what caused the resumption of nautical activity, but it seems probable that western Polynesia had become overpopulated and that the culture of the Indonesians in that region had been stimulated by their contact with Fiji. Immigrants from western Polynesia reached the Society group and explored northward from it until they rediscovered Hawaii. There they found a branch of the same people who had been modified by long isolation and so were able to establish themselves as overlords without meeting with serious opposition. They brought to Hawaii a few features of culture which they had acquired during their passage through southeastern Polynesia. In southeastern Polynesia the pressure of the invasion from the west forced some of the population to migrate to northern New Zealand and the southern Marquesas. These migrants were predominantly Caucasic and negroid in race but were probably under the direction of chiefs descended from the earlier Indonesian invaders of southeastern Polynesia. In New Zealand they destroyed the earlier Indonesian population or drove it into the undesirable localities. In the Marquesas they ousted the earlier population from the southern islands of the group but were unable to conquer the northern islands. After the departure of these emigrants from southeastern Polynesia, western Polynesian immigrants established themselves in the region, destroying or modifying the earlier type of culture.

The conditions in Polynesia are extremely complex, and the migration theory just outlined and the theory of the derivation of all the historic Polynesian cultures from three original cultures which were introduced by different races probably err on the side of simplicity. The division of Oceania into Polynesia, Micronesia and Melanesia is, in some respects, an arbitrary one and no final settlement of Polynesian problems will be possible until we have further information on the other two areas. Ingenious theories of cultural stratification have been advanced to account for the historic conditions in Melanesia, but Micronesia is still almost unknown scientifically and has been largely ignored by Polynesian students. Even our present fragmentary knowledge of Micronesia indicates that at least one of the Polynesian races passed through that region. A systematic study of Micronesian culture and physical type would no doubt provide a key to many of the Polynesian problems. 171 174

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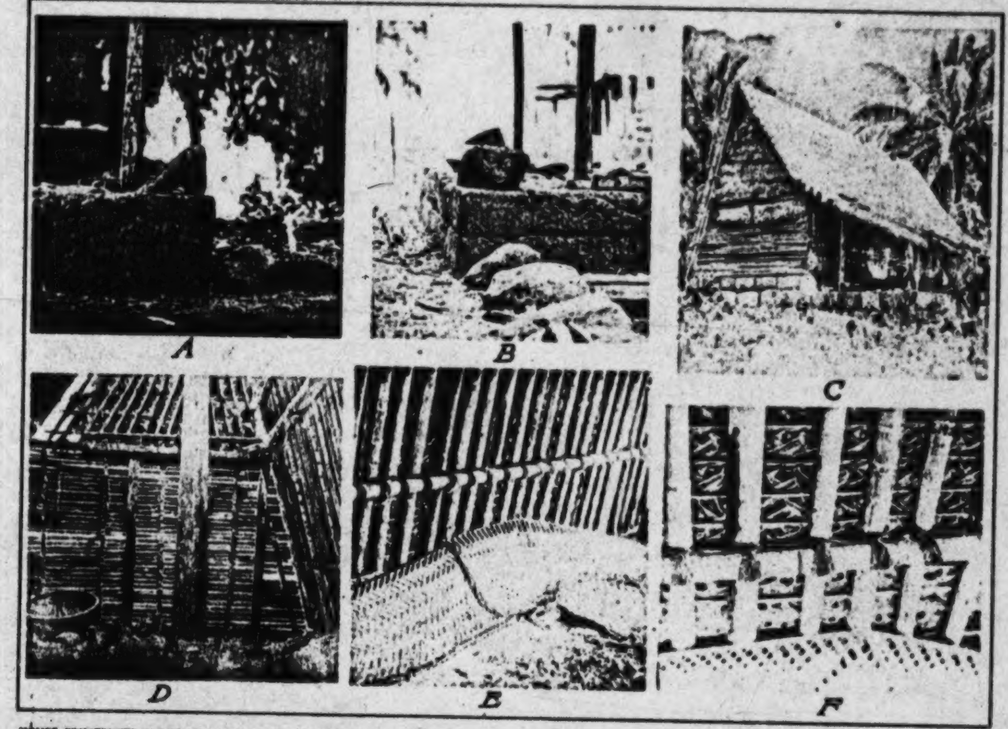
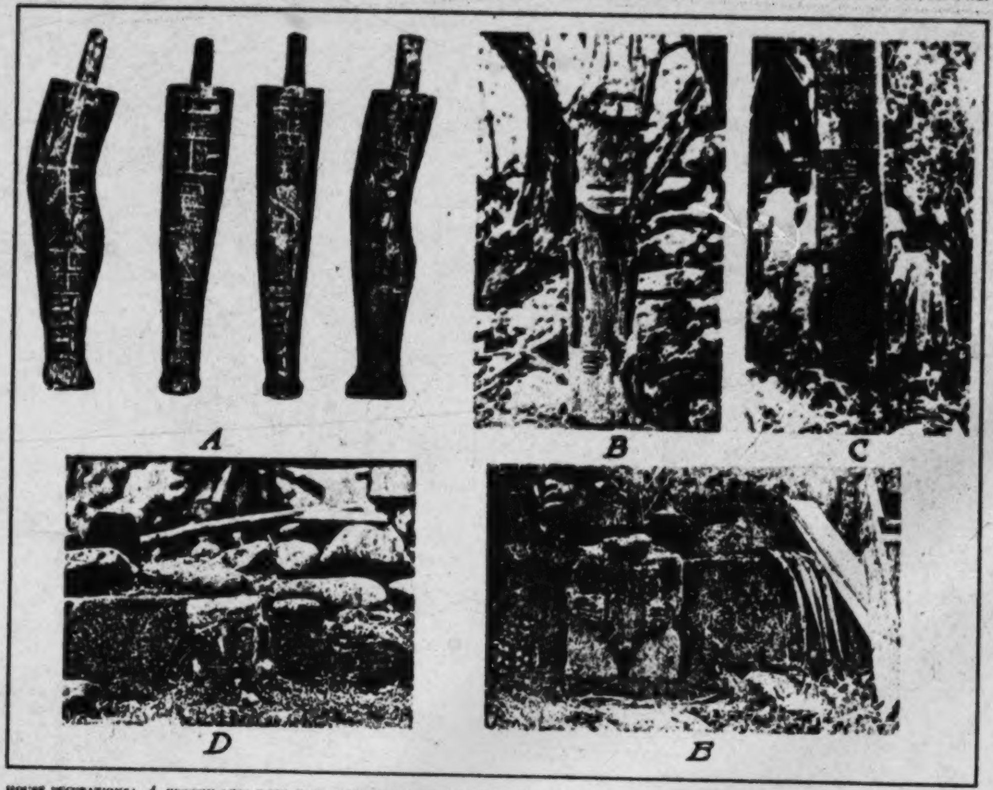


HOUSE CONSTRUCTION AND FURNISHINGS: *A*, BACK REST, SIDE VIEW; *B*, BACK REST, REAR VIEW; *C*, OLD HOUSE AT ATUONA, HIVA OA; *D*, FURNISHINGS AND CONSTRUCTION OF END WALL; *E*, CLOSE VIEW OF BED; *F*, ORNAMENTAL LASHINGS OF BACK REST.

[End plate 1]

[end plates]



HOUSE DECORATIONS: *A*, wooden legs with tattoo designs, probably used for bed; *B*, atlantid house post, from sacred house on island of Ua Huka; *C*, carved house post, island of Hiva Oa; *D*, *E*, stone figures from dwelling paepae in Pua Ma'u, Hiva Oa.

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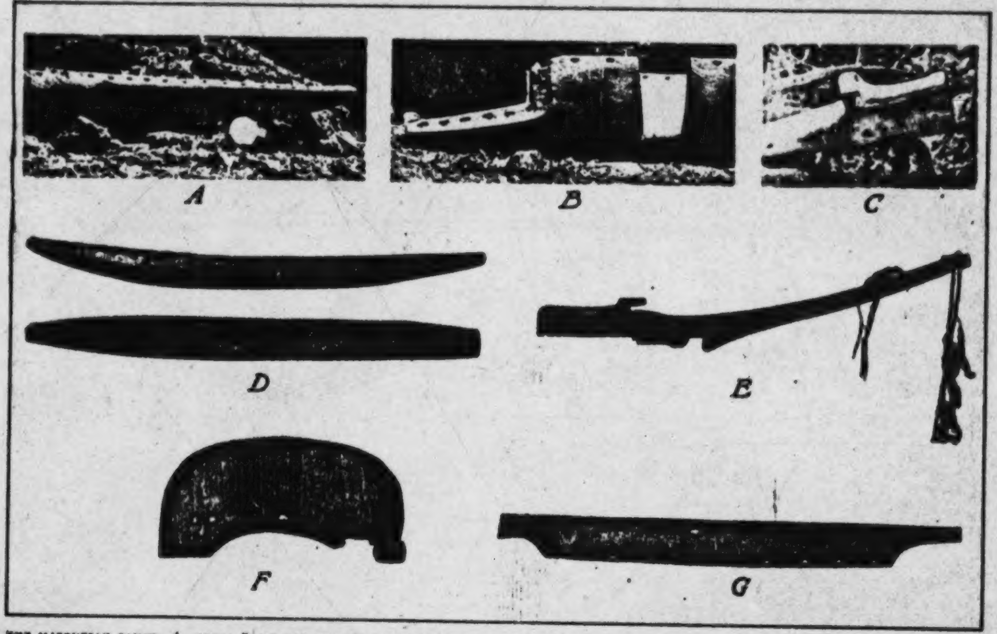
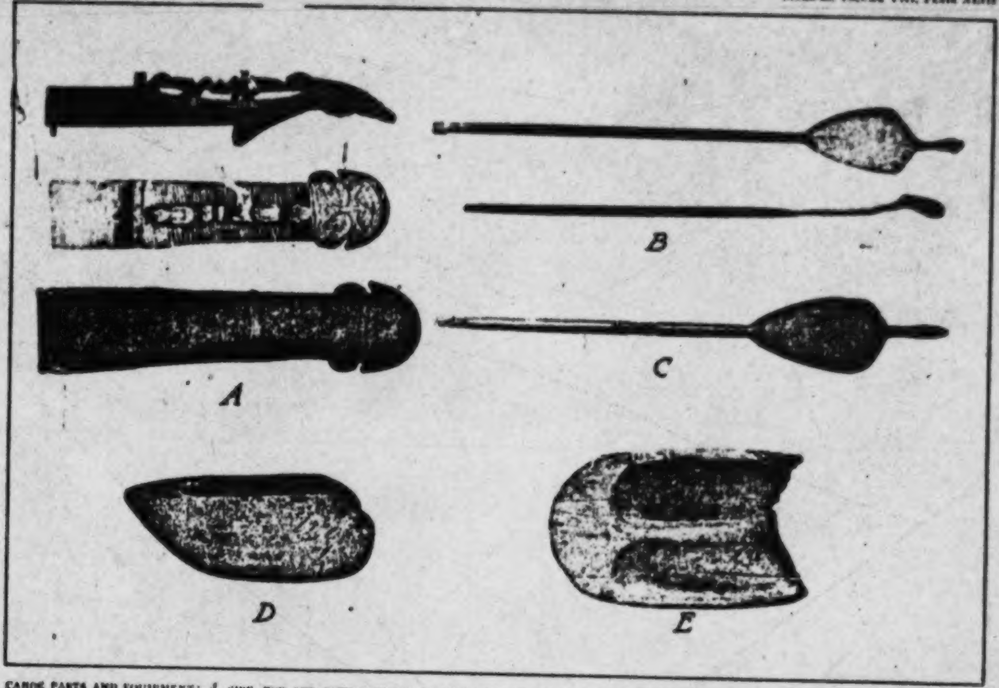


THE MARQUESAN CANOE: *A*, STERN; *B*, FORWARD END OF REAR SECTION OF UNDERBODY; *C*, STERN PIECE OF OLD CANOE; *D*, SIDE AND TOP VIEWS OF UNDERBODY OF OLD CANOE MODEL; *E*, STERN PIECE OF OLD CANOE MODEL; *F*, SUPPLEMENTARY BREAK-WATER; *G*, SIDE PLANK OF OLD CANOE MODEL.

[End plate 3]



CANOE PARTS AND EQUIPMENT: *A*, side, top and bottom views of bow piece from old model; *B*, rear and side views of ordinary paddle; *C*, modern carved paddle; *D* and *E*, side and top views of canoe bailer.

[End plate 4]

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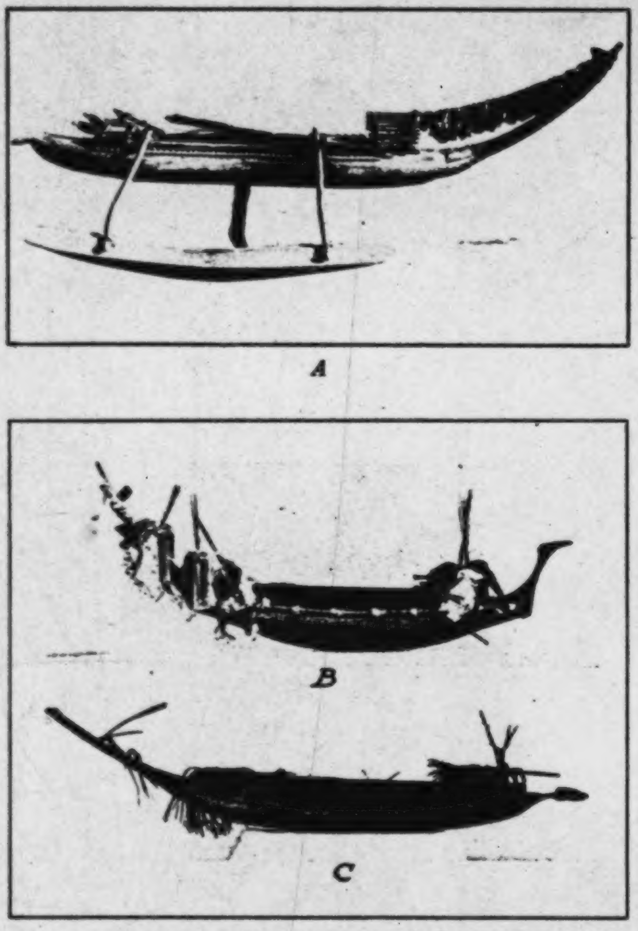

CANOE MODELS: *A*, VERY OLD MODEL (PEABODY MUSEUM, SALEM); *B*, MODERN MODEL, MADE FOR SALE; *C*, OLD MODEL, REPLICA OF ACTUAL CRAFT.

[end plate 5]

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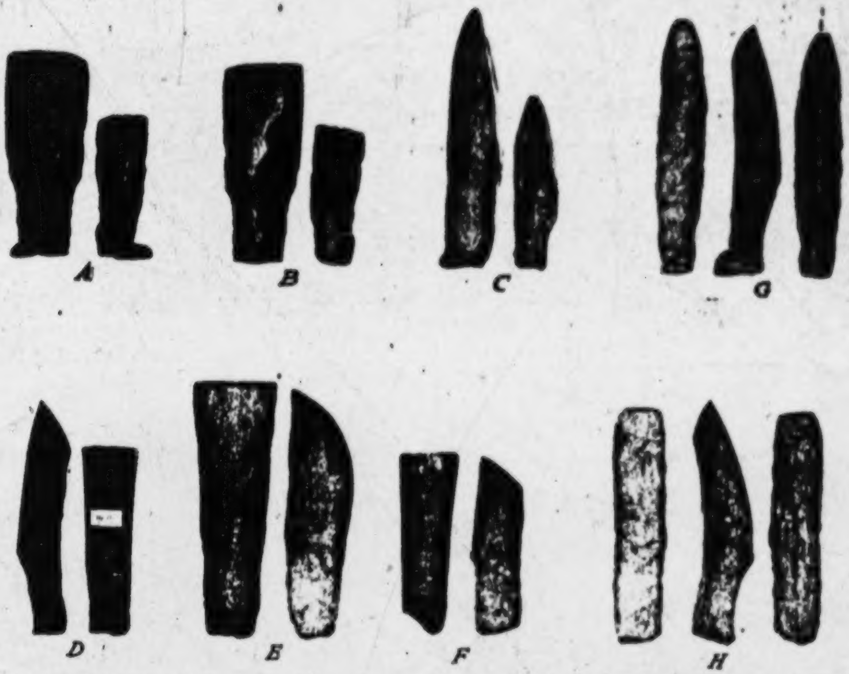
[end plate 6]



TANGED ADZES: *A*, FRONT VIEW; *B*, REAR VIEW; *C*, SIDE VIEW OF ADZES WITH TRIANGULAR CROSS SECTION; *D*, FRONT AND SIDE VIEWS OF ADZES WITH QUADRANGULAR CROSS SECTION; *E*, *F*, FRONT AND SIDE VIEWS OF ADZES OF TOKI AA TYPE; *G* AND *H*, ADZES OF TOKI KOUMA TYPE—FRONT, SIDE AND REAR VIEWS.

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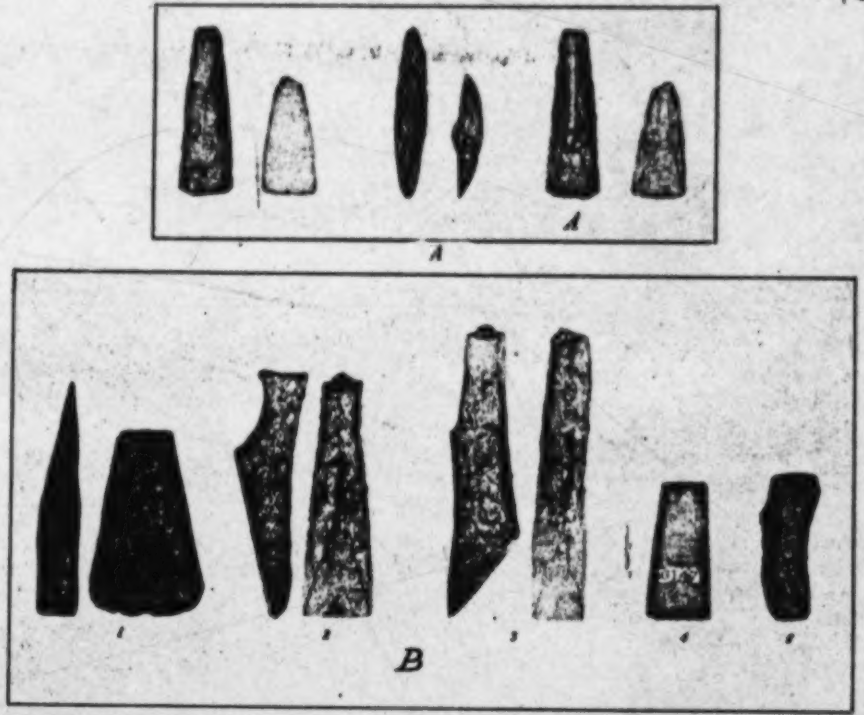
Ti Linton E-5 (1920-1921) 1923 CCCS Marquesas



TANGLESS AND UNCLASSIFIED ADZES: *A*, tangless adzes, front, side, and rear views; *B*, unclassified adzes, front and side views—1, Bishop Museum no. 6138; 2, Bishop Museum no. B3073; 3, Bishop Museum no. B3076; 4, Bishop Museum no. 6147; 5, Bishop Museum no. B3085.

[end plate 7]

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Bernice P. Bishop Museum

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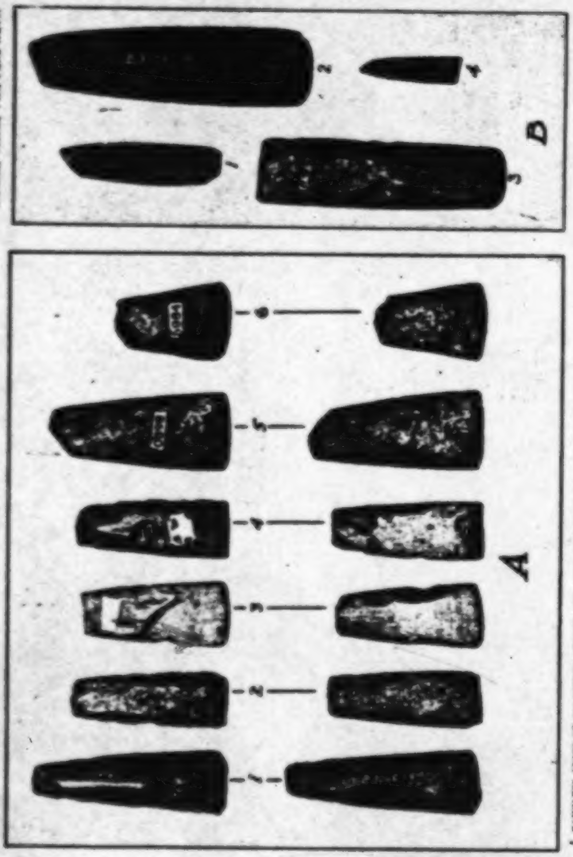

A, TANGLESS ADZES OF POLYNESIA, FRONT AND REAR VIEWS: 1, MARQUESAS; 2, TONGA; 3, SAMOA; 4, EASTER ISLAND; 5, CHATHAM ISLANDS; 6, SOCIETY ISLANDS; B, MARQUESAN GOUGES.

[end plate 8]

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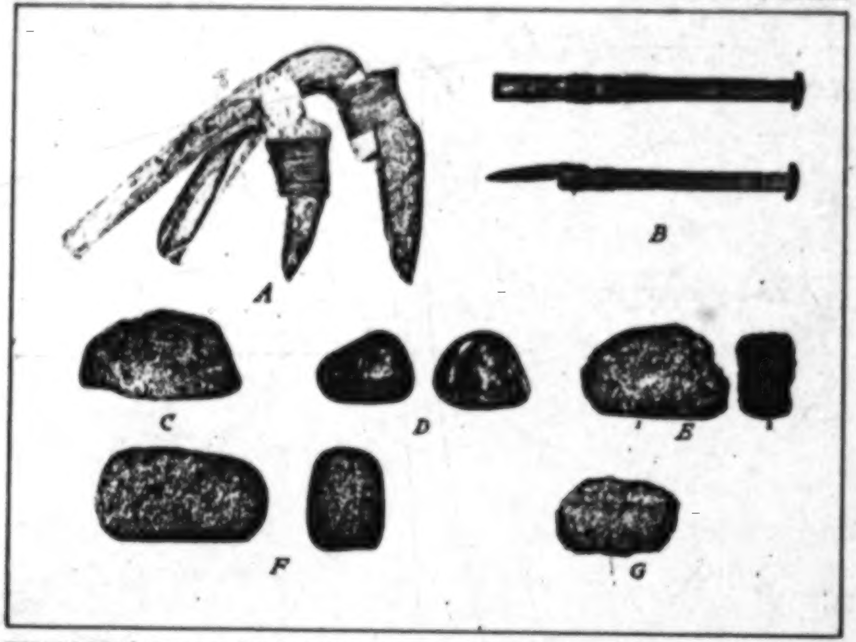

STONE IMPLEMENTS: *A*, HAFTED ADZES; *B*, HAFTED CHISEL, FRONT AND SIDE VIEWS; *C*, RUBBING STONE OF CORAL; *D*, [illegible] USED TO POLISH WOOD; *E*, SCRAPERS; *F*, HAMMER STONES; *G*, KNIFE.

[end plate 9]

Ti Linton E-5 (1920-1921) 1923 Marquesas

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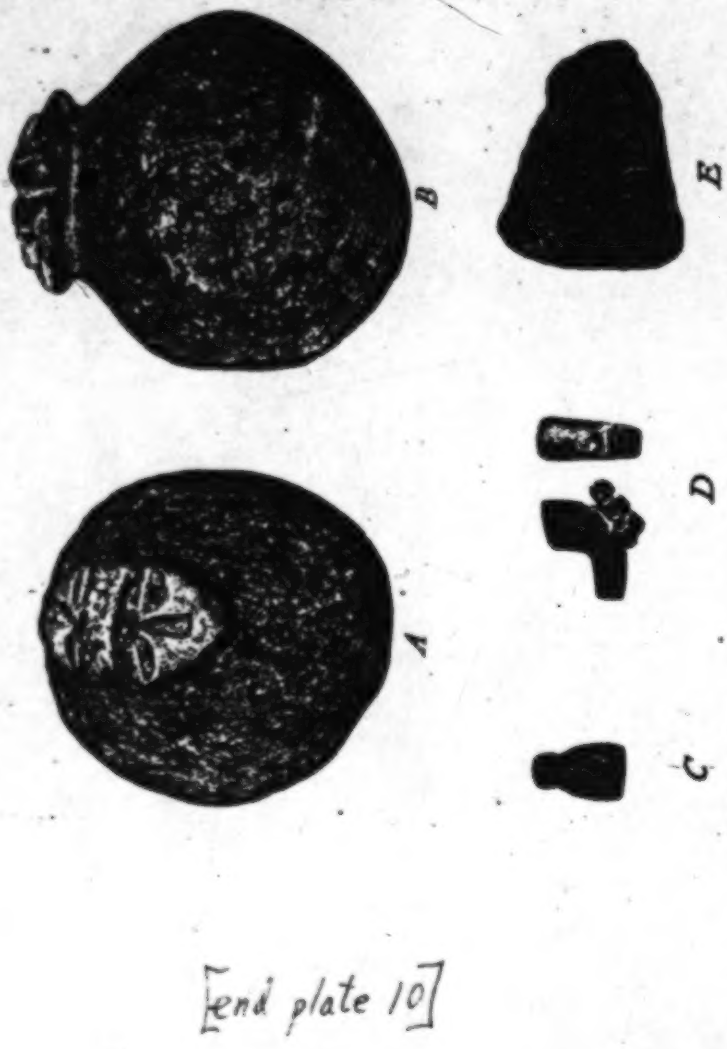
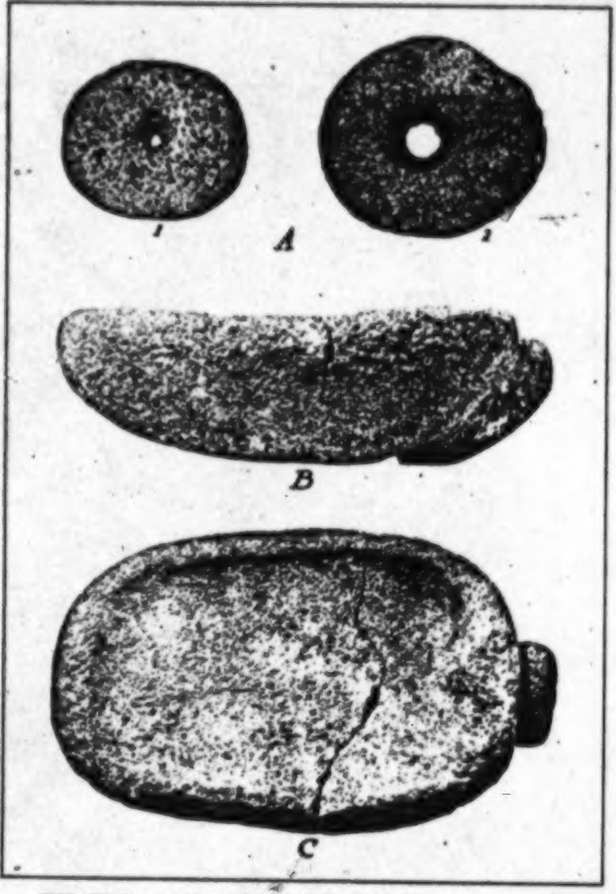


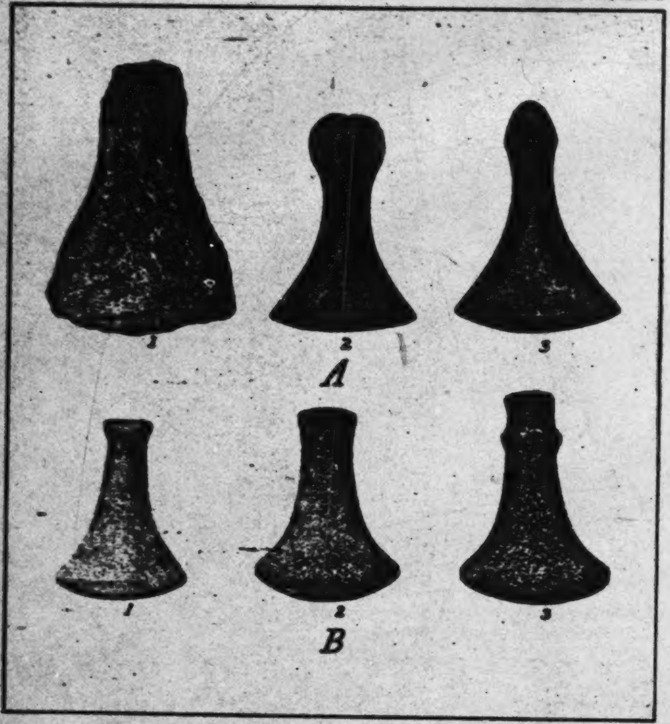
STONE ARTIFACTS AND UTENSILS: A, TOP VIEW; B, SIDE VIEW OF CARVED NET SINKER (UNIVERSITY MUSEUM, PHILADELPHIA); C, PIPE; D, EFFIGY PIPE, SIDE AND FRONT VIEWS; E, FRAGMENT OF DECORATED BOWL.

[end plate 10]



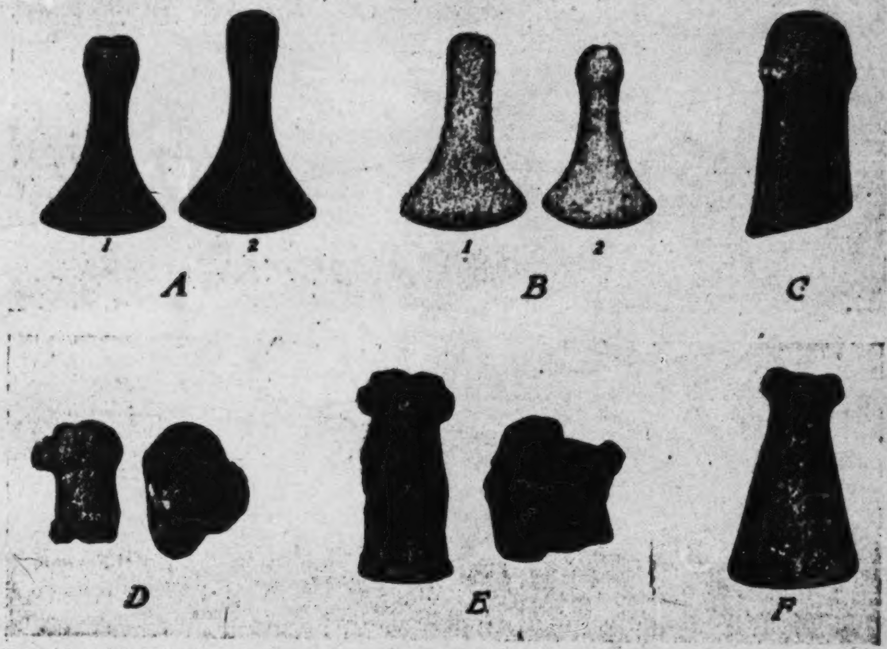
STONE ARTIFACTS AND UTENSILS: *A*, PERFORATED DISCS; *B* AND *C*, SIDE AND TOP VIEWS OF TRAY.

[end plate 11]



STONE POUNDERS: A, MODERN COMMERCIAL POUNDERS FROM UA HUKA, FIGURE AT THE LEFT SHOWS FIRST STAGE OF MANUFACTURE; B, ANCIENT POUNDERS, OPU TYPE.

[end plate 12]



STONE POUNDERS: *A*, PHALLIC POUNDERS OF NORMAL FORM, SIDE AND END VIEWS; *B*, PHALLIC POUNDERS OF UNUSUAL FORM; *C*, HEAD AND NECK OF PHALLIC POUNDER OF UNUSUAL FORM; *D*, HEAD AND NECK OF CONICAL POUNDER, SIDE AND TOP VIEWS; *E*, DOUBLE HEADED CONICAL POUNDER, SIDE AND TOP VIEWS; *F*, UNCARVED CONICAL POUNDER.

[end plate 13]

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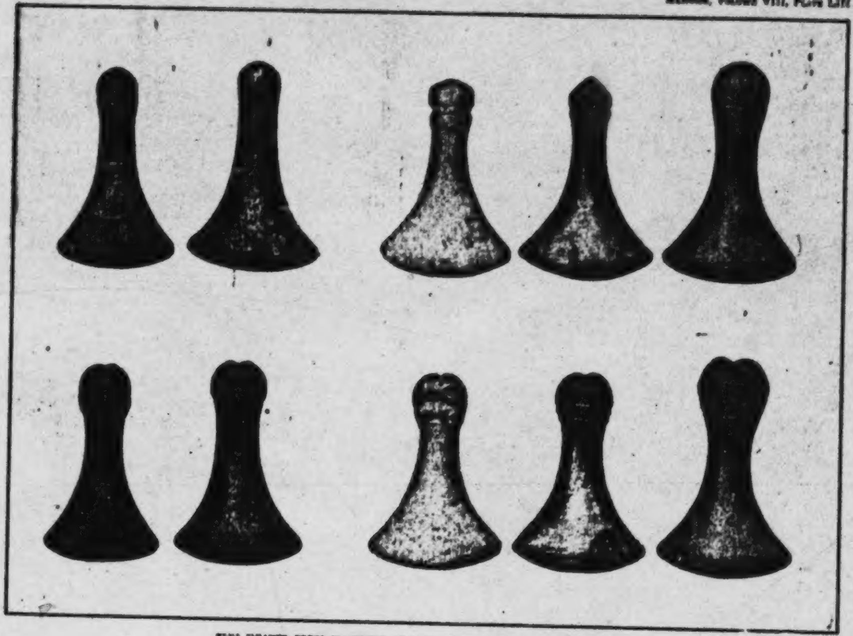

TIKI HEADED POPOI POUNDERS OF NORMAL TYPE, FRONT AND SIDE VIEWS

[End plate 14]

Bernice P. Bishop Museum

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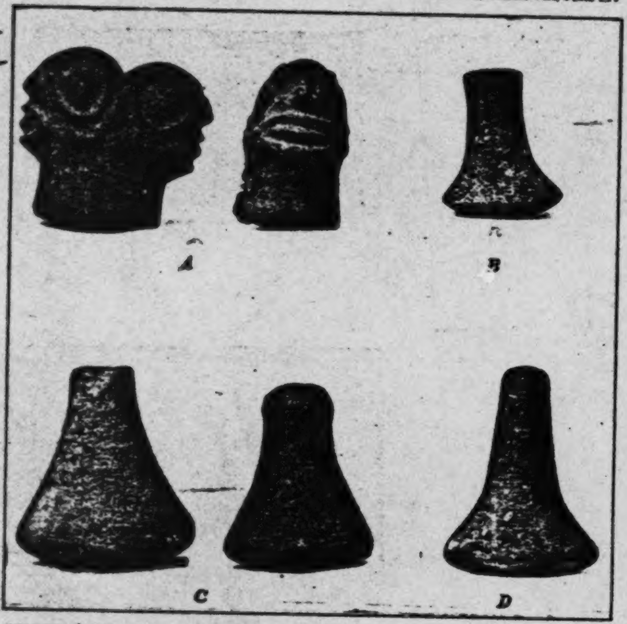
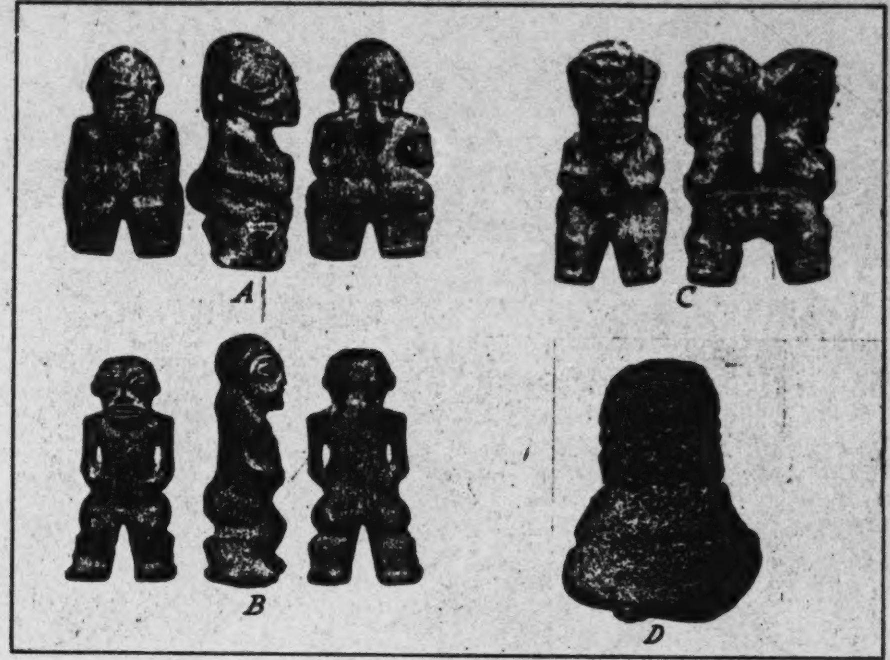


POUNDERS: *A*, HEAD OF POUNDER OF UNUSUAL TYPE, FRONT AND SIDE VIEWS; *B*, CHILD'S POUNDER; *C*, POUNDERS FOR INFANTS' FOOD; *D*, SALT POUNDER.

[end plate 15]

[End plate 16]



STONE CARVINGS: *A*, *B*, STONE FIGURES, FRONT, SIDE AND REAR VIEWS; *C*, DOUBLE FIGURE, FRONT AND SIDE VIEWS; *D*, OBJECT OF UNKNOWN PURPOSE, HEADS CARVED ON UPPER END.

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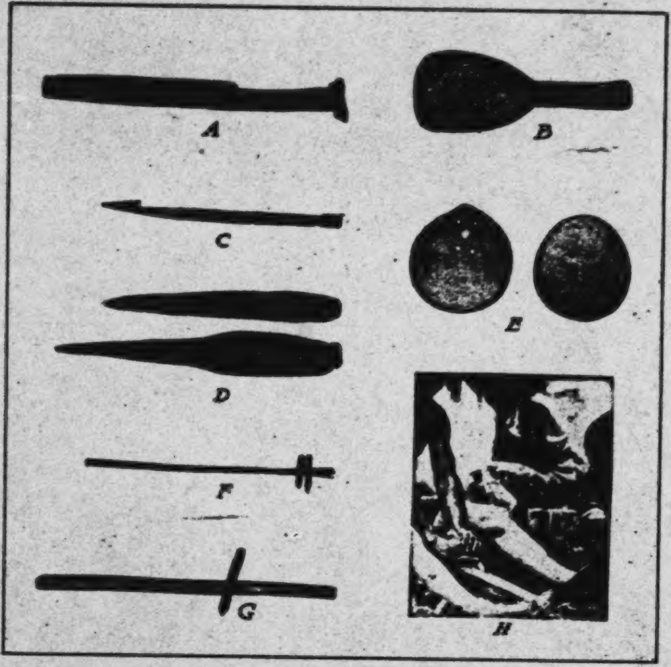
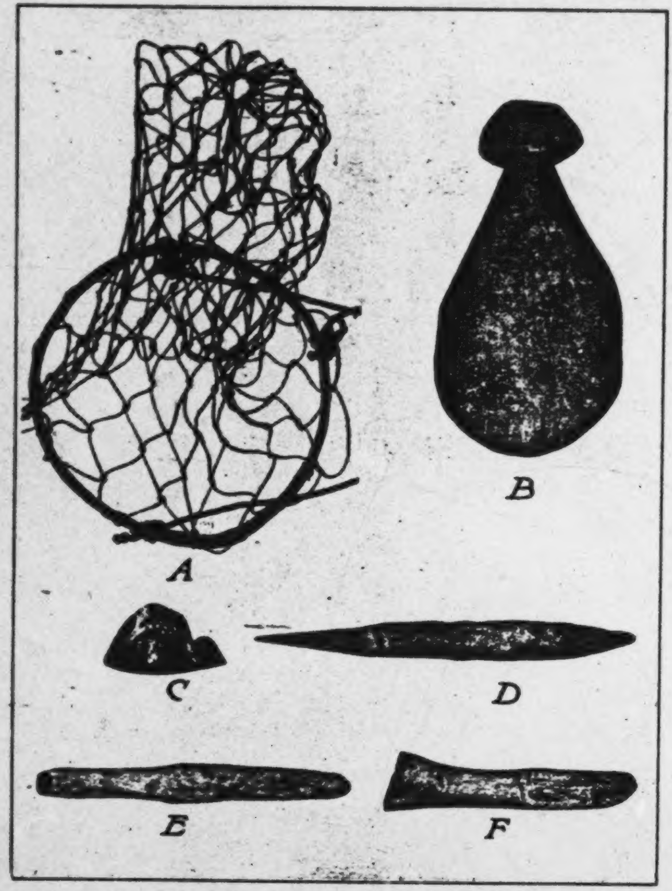


[372]

MISCELLANEOUS IMPLEMENTS: *A*, SHARK SKIN RASP; *B*, MALLET; *C*, THATCHING NEEDLE; *D*, TOOLS FOR MAKING COPRA; *E*, BOWLS OF LARGE SPOONS OR LADLES; *F*, COTTON SEED EXTRACTOR; *G*, FIRE STICKS; *H*, METHOD OF USING FIRE STICKS.

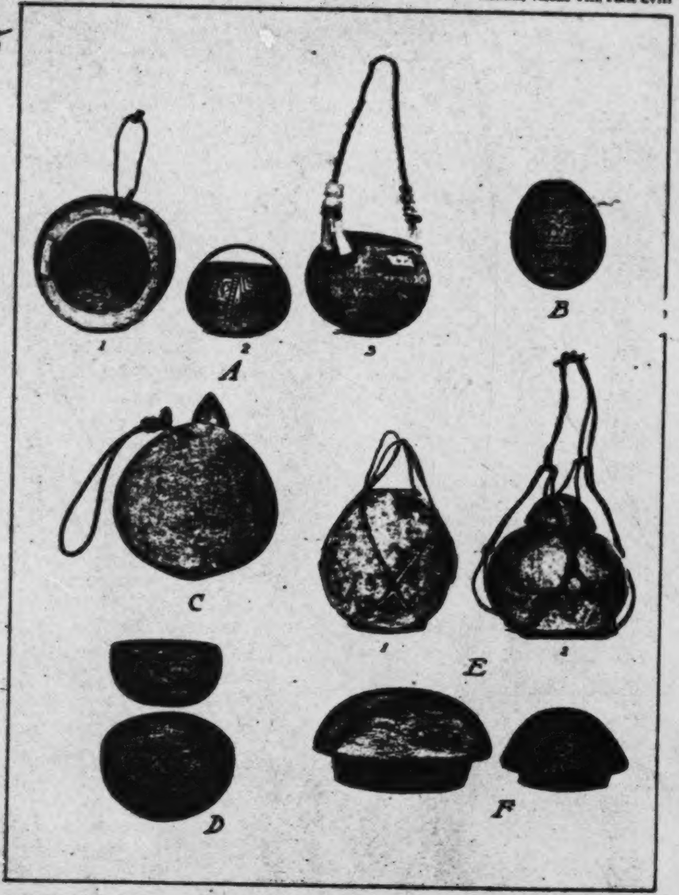
[end plate 17]



ARTICLES USED IN PREPARING BREADFRUIT: *A*,-NET FOR CARRYING FRUIT; *B*, SPLITTER; *C*, PEELER; *D*, STICK FOR PIERCING FRUIT; *E*, WOODEN KNIFE; *F*, BONE KNIFE FOR PEELING COOKED FRUIT.

[end plate 18]

[531]



COCONUT SHELL AND GOURD CONTAINERS: *A*, COCONUT BOWLS — (1) WITH LOOP FOR SUSPENSION, (2) WITH HANDLE MADE FROM SHELL, (3) WITH DECORATED CORD HANDLE; *B*, COCONUT BOTTLE FOR OIL; *C*, COCONUT BOTTLE FOR WATER; *D*, CARVED COCONUT CUPS; *E*, GOURD CONTAINERS (HUE); *F*, STOPPERS FOR GOURD CONTAINERS.

[end plate 19]

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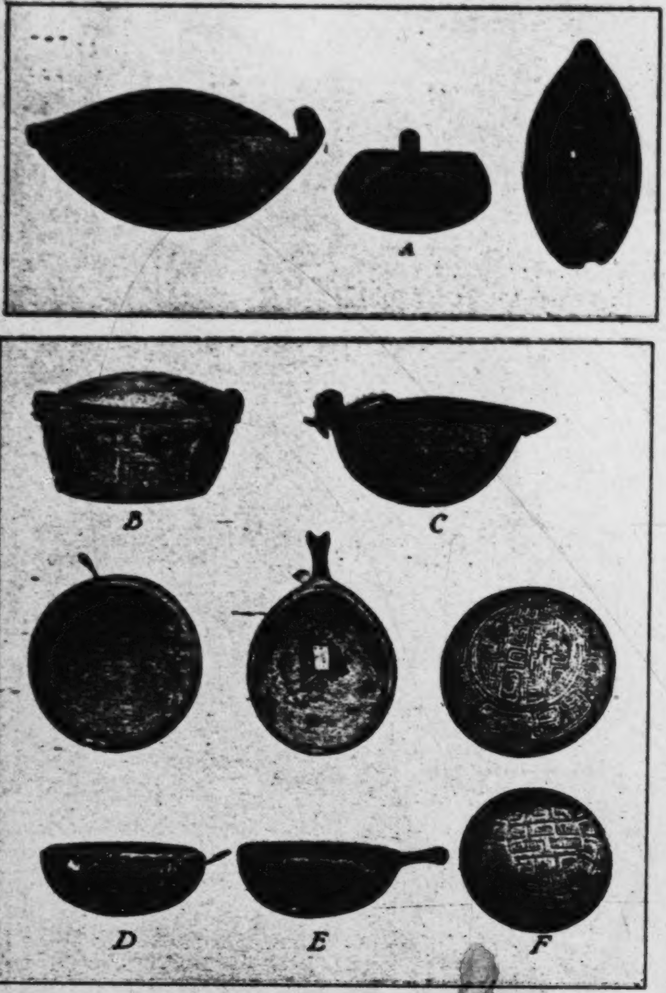

WOODEN CONTAINERS: *A*, LARGE BOX, VIEWS OF SIDE, END AND INSIDE OF LID; *B*, CARVED BOX, UNUSUAL FORM; *C*, SMALL BOX; *D*, BOWL WITH LOOP FOR SUSPENSION, TOP AND SIDE VIEWS; *E*, BOWL WITH HANDLE, TOP AND SIDE VIEWS; *F*, CARVED BOWLS, BOTTOM VIEWS.

[end plate 22]

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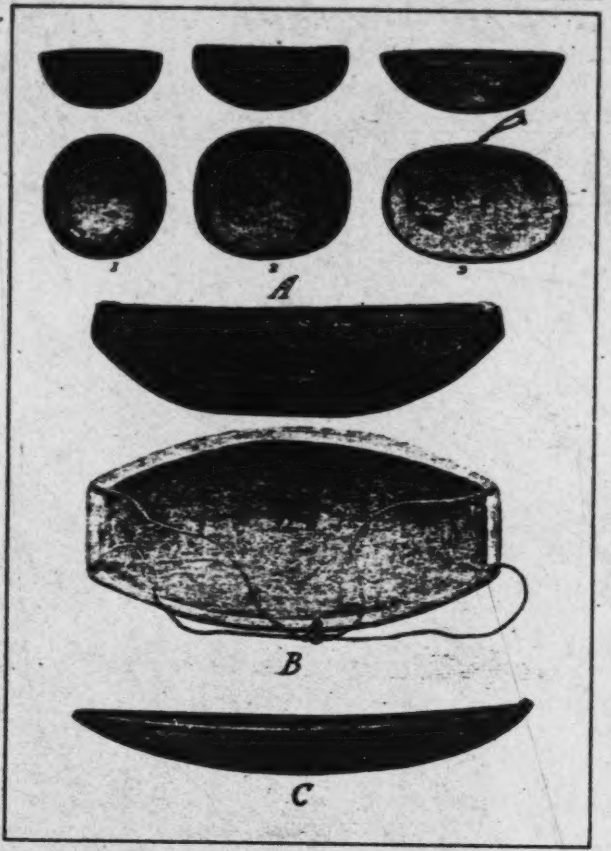

WOODEN BOWLS AND TRAYS: *A*, BOWLS—(2) AND (3) KAVA BOWLS, TOP AND SIDE VIEWS; *B*, [illegible], SIDE AND TOP VIEWS; *C*, LARGE OVAL DISH OR TRAY.

[end plate 21]

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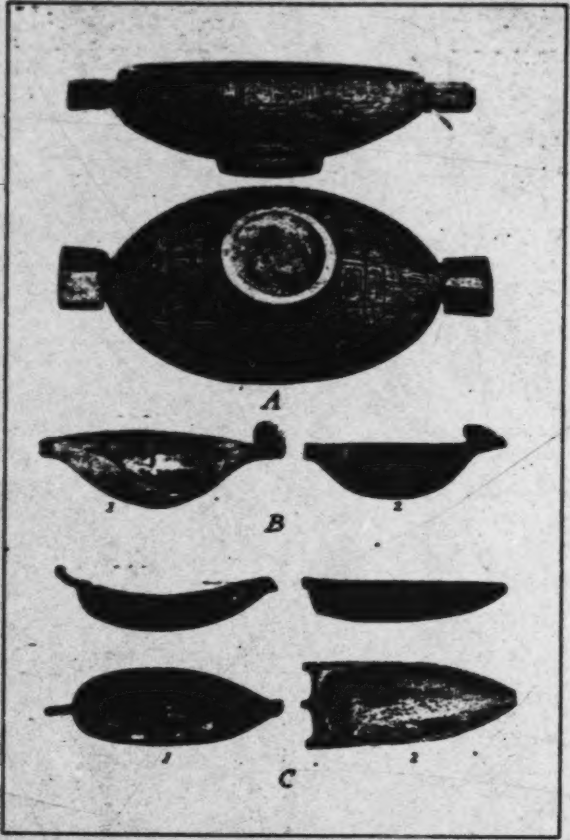
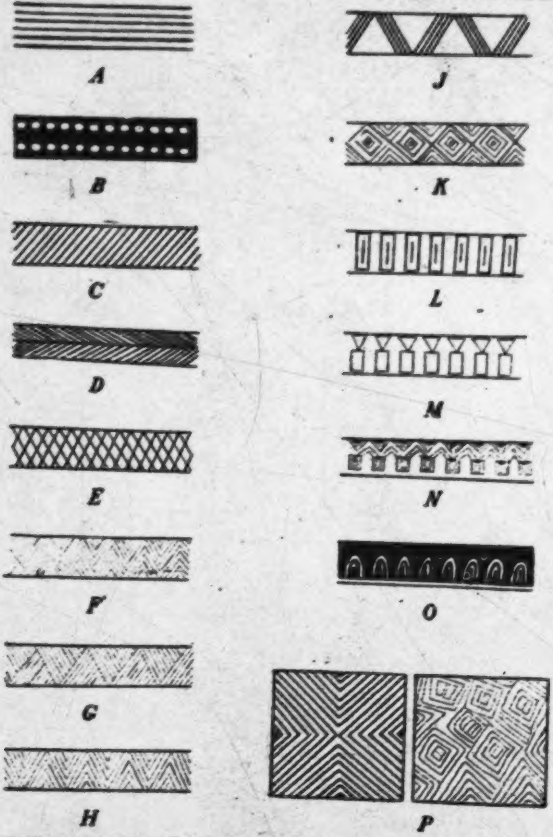


WOODEN DISHES AND BOWLS: *A*, OVAL DISH WITH BASE, SIDE AND BOTTOM VIEWS; *B*, SMALL BOWLS; *C*, KAVA BOWLS OF UNUSUAL FORM, SIDE AND TOP VIEWS.

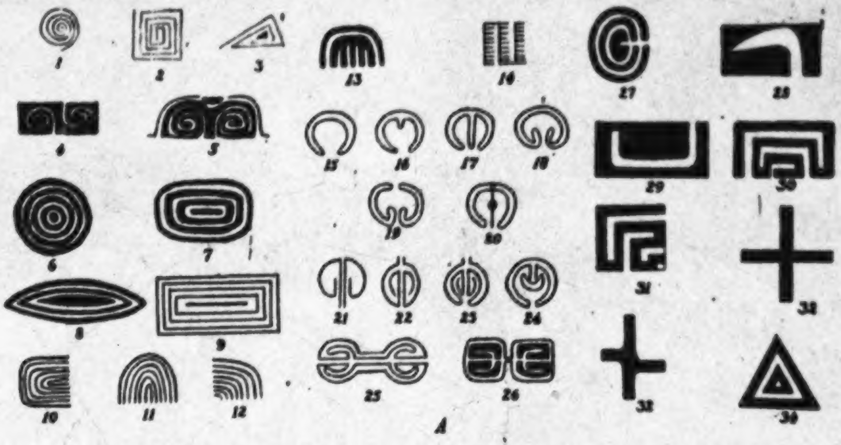
[end plate 22]



DESIGNS ON CONTAINERS: *A-O*, BAND DECORATIONS; *P*, *Q*, DESIGNS USED TO FILL SECTIONS.

[end plate 23]

[end plate 24]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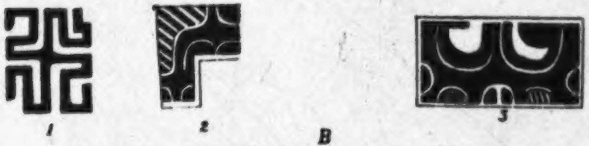

DESIGN ELEMENTS AND ART MOTIFS: *A*, 1-34, DESIGN ELEMENTS; *B*, 1-3, ART MOTIFS.

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Bernice P. Bishop Museum

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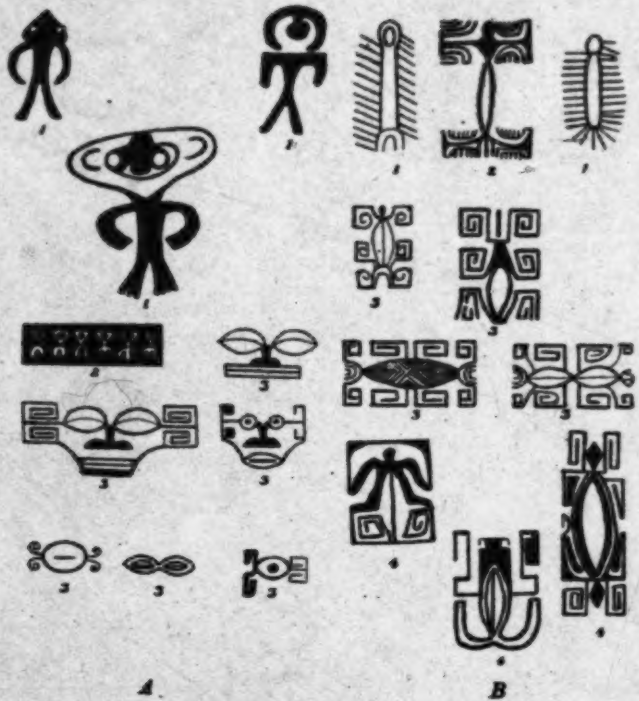
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REPRESENTATIONS OF HUMAN AND ANIMAL FIGURES: A, 1-3, HUMAN FIGURES; B, 1-4, ANIMAL FIGURES

[end plate 25]

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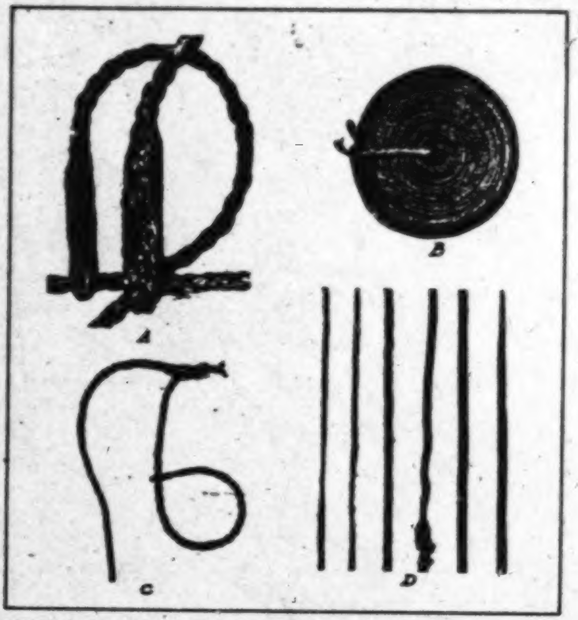

CORDAGE: *A*, LOOPS OF PIG TETHERS SHOWING KINDS OF PLAITING; *B*, ROLL OF CORD USED FOR DRUMS; *C*, PIG TETHERS OF FAU BARK; *D*, COCONUT FIBER CORD.

[end plate 26]

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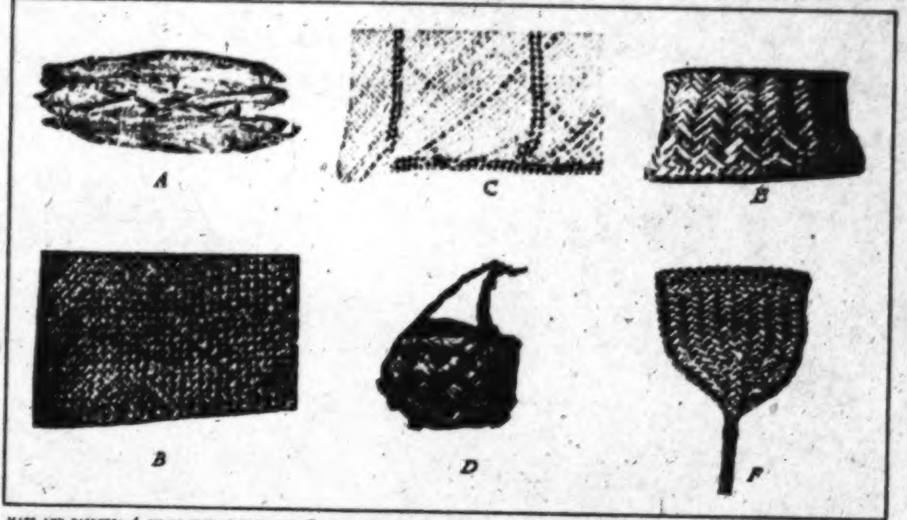
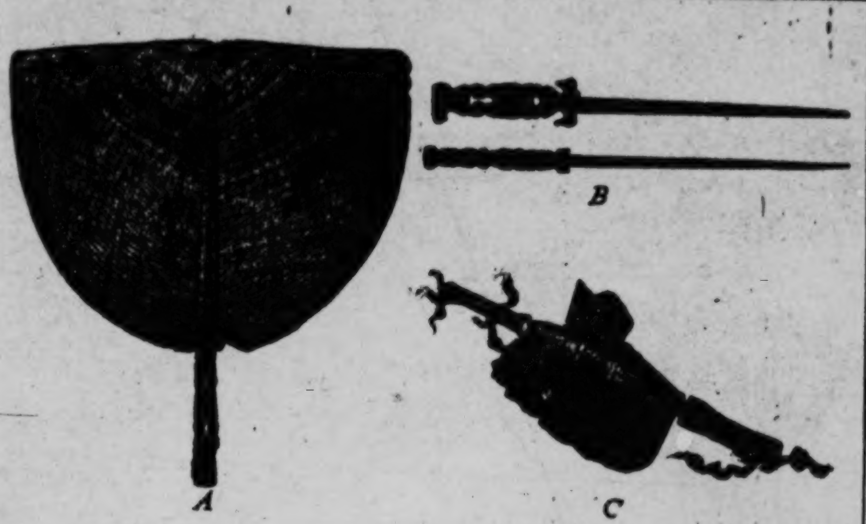


MATS AND BASKETS: *A*, SMALL MAT OF TI LEAVES; *B*, PLAIN PANDANUS MAT; *C*, PANDANUS MAT EMBROIDERED IN RED; *D*, BASKET, KŌAHO TYPE; *E*, BASKET, HAKETE TYPE; *F*, FAN OF BASKET WEAVE—TYPE IN USE IN 1920.

[end plate 27]

[end plate 25]



CEREMONIAL FANS: A, CHIEF'S FAN (PEABODY MUSEUM, SALEM); B, HANDLE OF CHIEF'S FAN, SIDE AND FRONT VIEWS; C, TORTOISE SHELL FAN USED BY EMBALMERS.

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Bernice P. Bishop Museum

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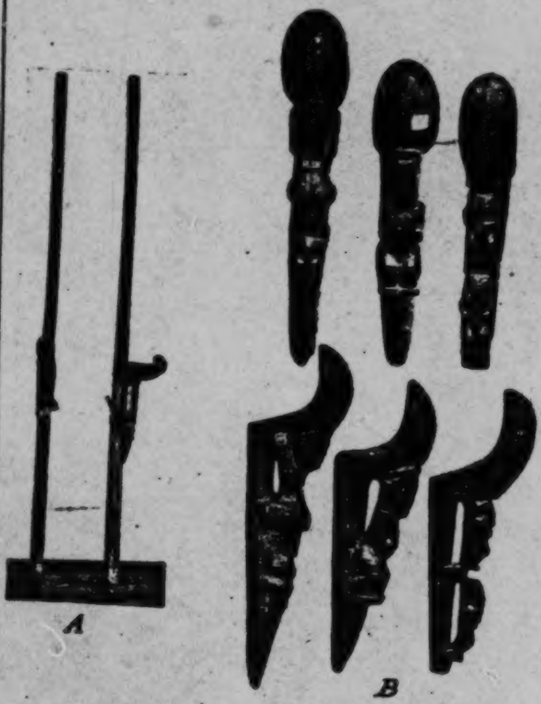

STILTS: *A*, MODERN STILTS; *B*, DECORATED STILT STEPS, FRONT AND SIDE VIEWS.

[end plate 29]

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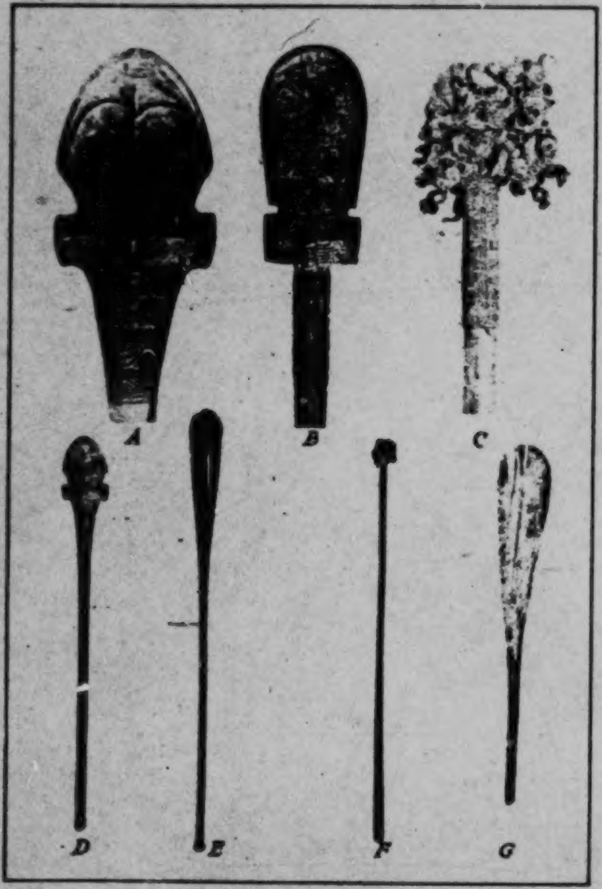

CLUBS AND STAFFS: *A*, HEAD OF OLD U'U; *B*, HEAD OF MODERN U'U; *C*, TOP OF CHIEF'S STAFF; *D*, U'U, FRONT VIEW; *E*, PARAHU, FRONT VIEW; *F*, CHIEF'S STAFF; *G*, SCEPTER OF CHIEF'S SON (HOUVAA).

[end plate 30]

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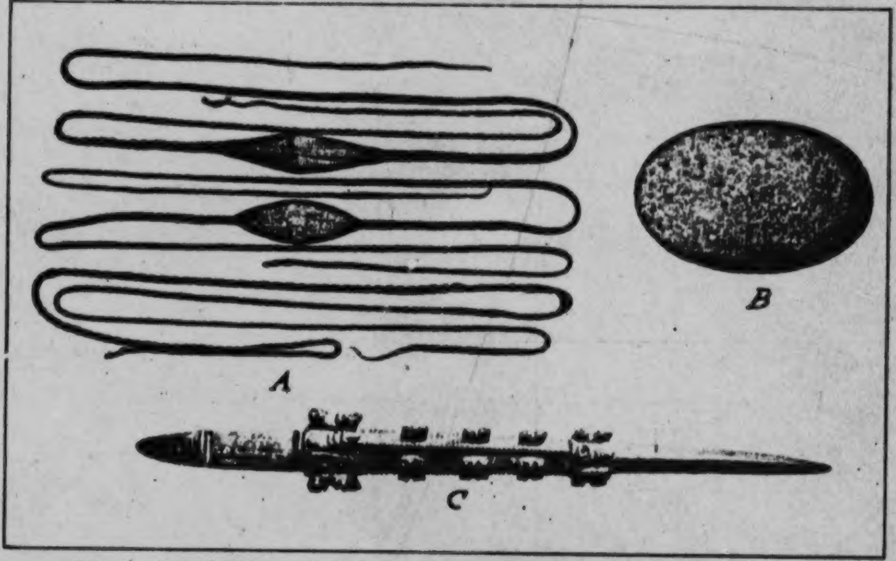
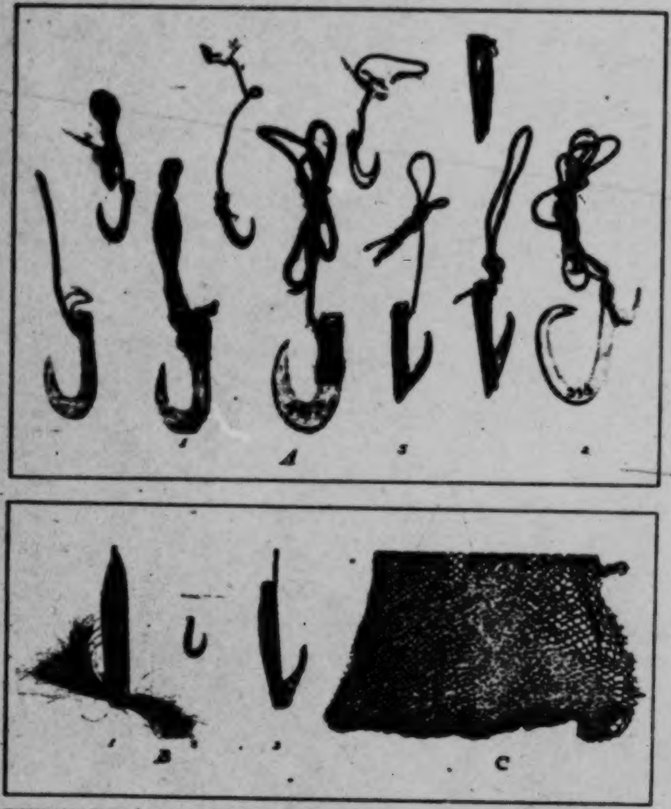
[End plate 31]



SLINGS AND HARPOON: *A*, SLING, OUTSIDE AND INSIDE VIEWS (PEABODY MUSEUM, SALEM); *B*, SLING STONE; *C*, HEAD OF HARPOON (UNITED STATES NATIONAL MUSEUM).



FISHING APPLIANCES: *A*, PEARL SHELL FISH HOOKS (PEABODY MUSEUM, SALEM); *B*, COMPOSITE HOOKS OF SHELL AND OF BONE AND SHELL; *C*, SMALL FISH NET.

[end plate 32]

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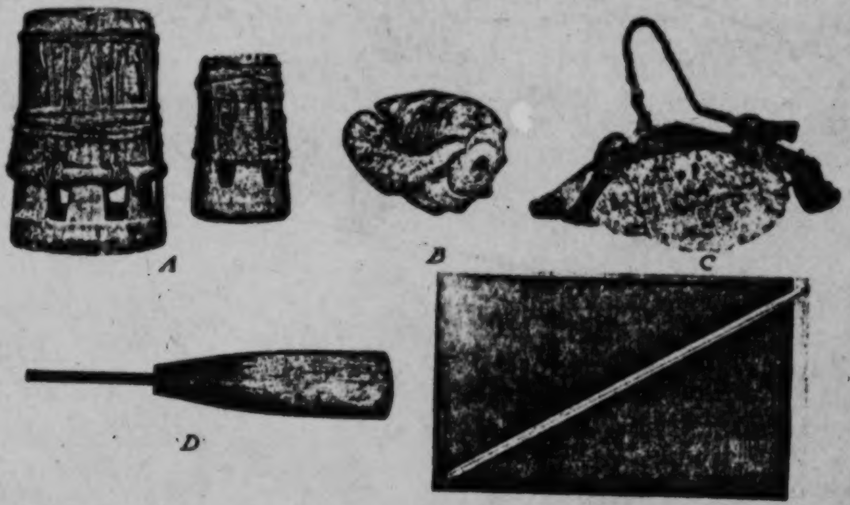
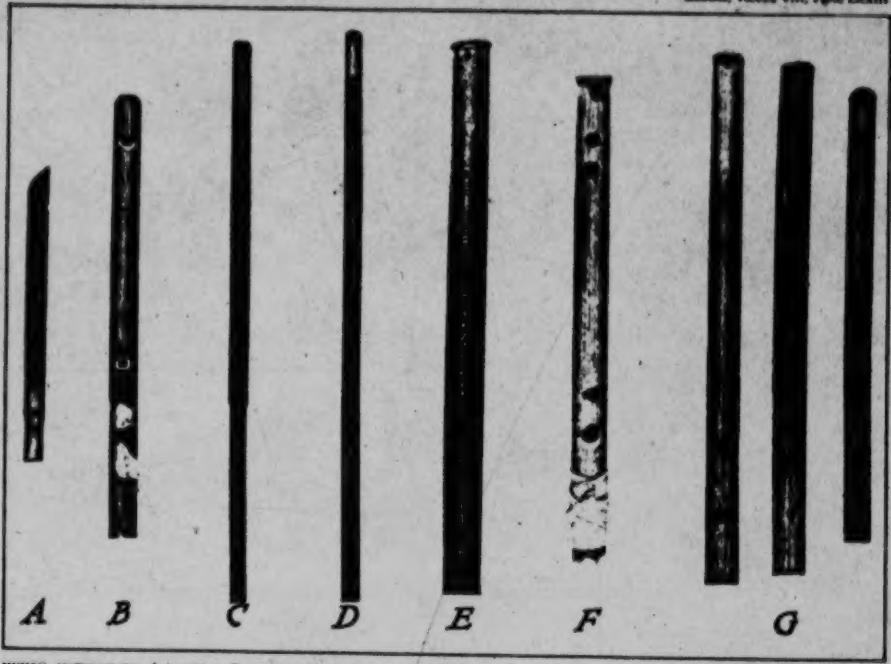
[end plate 33]



MUSICAL INSTRUMENTS: *A*, DRUMS; *B*, CASSIS SHELL TRUMPET; *C*, CONCH SHELL TRUMPET; *D*, WOODEN TRUMPET; *E*, MUSICAL BOW.

7: Linton E-5 (1920-1921) 1923 OX6 Marquesas OX6

[end plate 34]



MUSICAL INSTRUMENTS: *A*, WHISTLE; *B*, WHISTLE FLUTE; *C*, TUNABLE MOUTH FLUTE; *D*, MOUTH FLUTE (PUAKAHAU) ORDINARY FORM; *E*, DECORATED NOSE FLUTE; *F*, NOSE FLUTE, UNUSUAL FORM (LOCATION DOUBTFUL); *G*, NOSE FLUTES, ORDINARY FORM.

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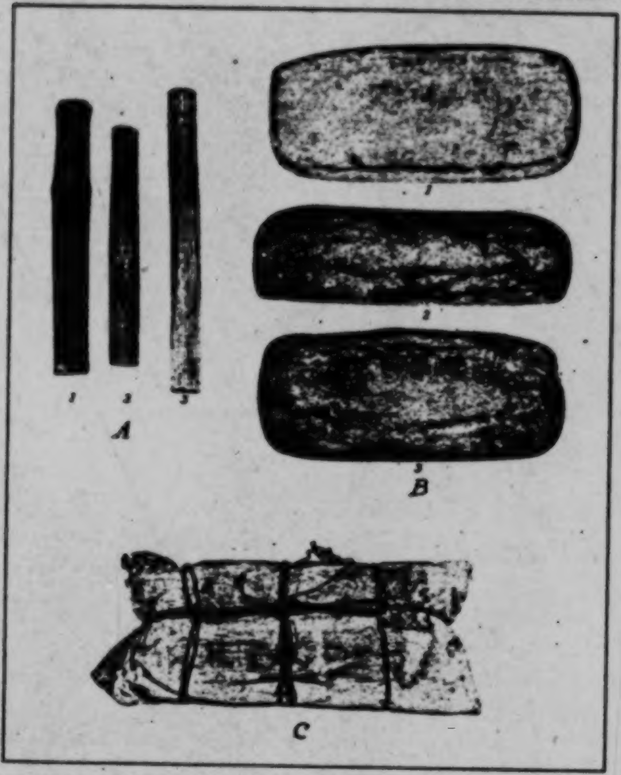

TOOLS FOR TAPA MAKING: *A*, TAPA BEATERS—(1) SQUARE WITH HANDLE, (2) SQUARE WITHOUT HANDLE, (3) ROUND; *B*, STONE TAPA ANVIL—(1) TOP VIEW, (2) SIDE VIEW, (3) BOTTOM VIEW; *C*, BUNDLE OF FINISHED TAPA.

[end plate 35]

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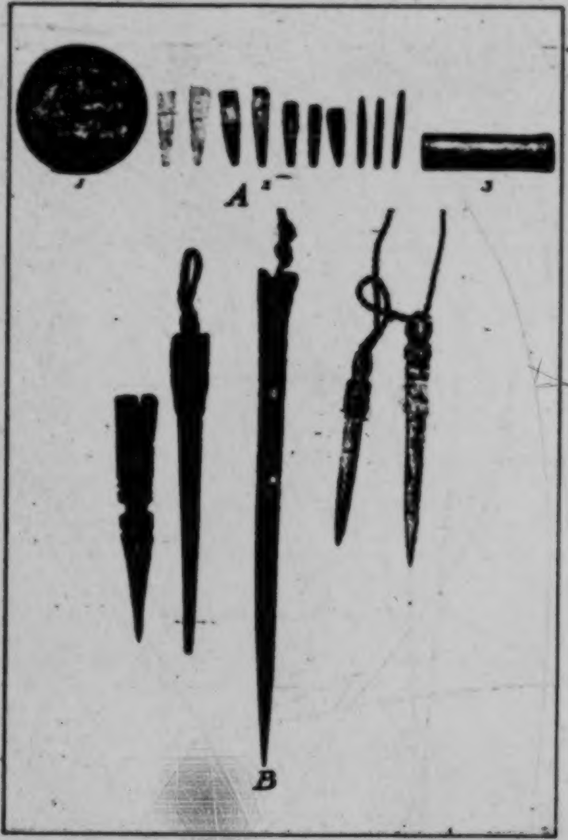
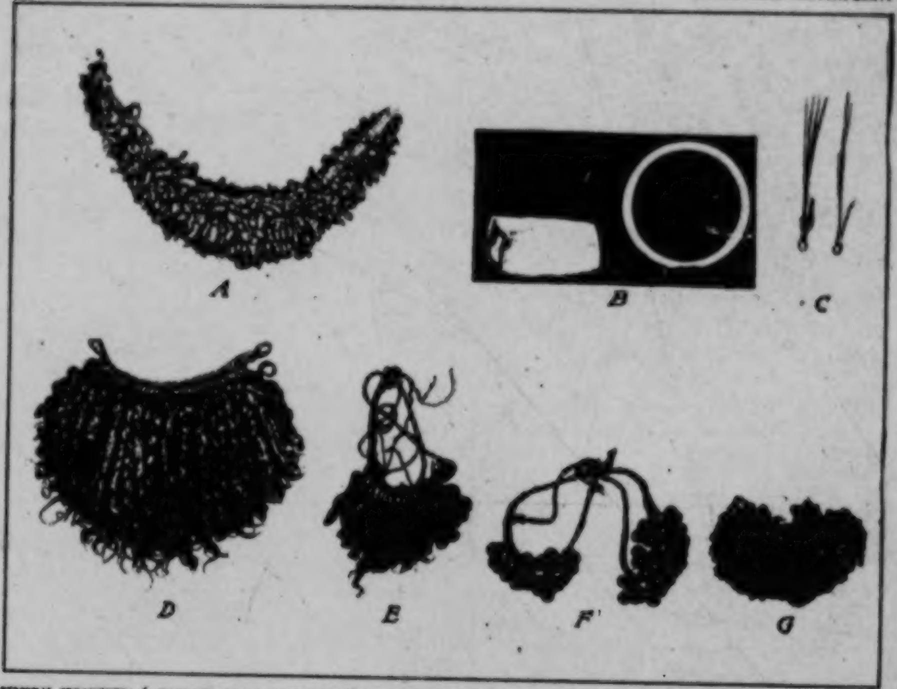


INSTRUMENTS FOR PERSONAL ORNAMENTATION: *A*, TATTOOING INSTRUMENTS—(1) COCONUT CUP CONTAINING PIGMENT, (2) COMBS OF HUMAN AND BIRD BONE, (3) BAMBOO BOX IN WHICH COMBS ARE KEPT; *B*, EAR PIERCERS OF BONE AND TORTOISE SHELL.

[end plate 36]



PERSONAL ORNAMENTS: *A*, SHOULDER ORNAMENT OF HAIR; *B*, SHELL BRACELETS; *C*, FINGER ORNAMENTS OF TROPIC BIRD FEATHERS; *D*, ORNAMENT OF HAIR FOR WAIST OR SHOULDERS; *E*, ORNAMENTS OF HAIR FOR THE WRISTS; *F*, WRIST ORNAMENTS OF LARGE SEEDS; *G*, WRIST ORNAMENT OF ABRUS PRECATORIUS SEEDS. (*C*, *F*, *G*, PEABODY MUSEUM, SALEM.)

[end plate 37]

7: Linton E-5 (1920-1921) 1923 OE6 Marquesas Cul-

Bernice P. Bishop Museum

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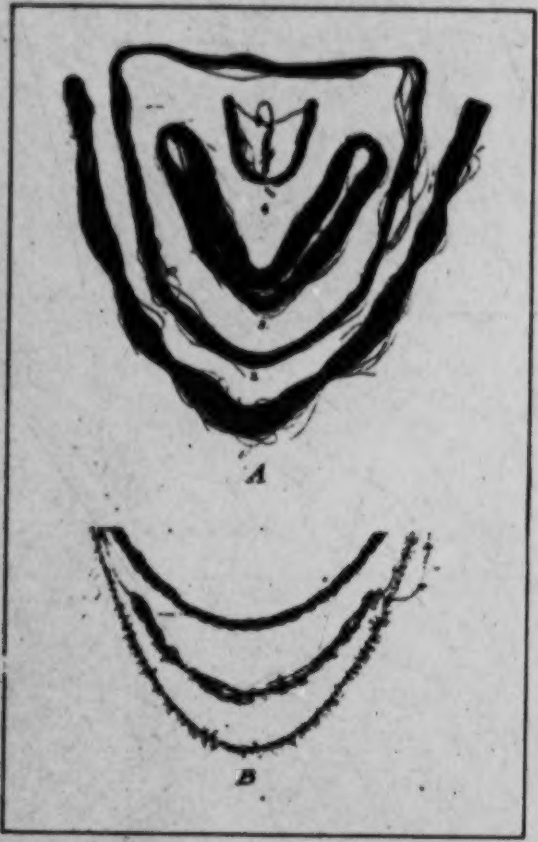

PERSONAL ORNAMENTS: *A*, NECKLACE OF PLAITED HAIR; *B*, NECKLACE OF PORPOISE TEETH AND BEADS.

[end plate 38]

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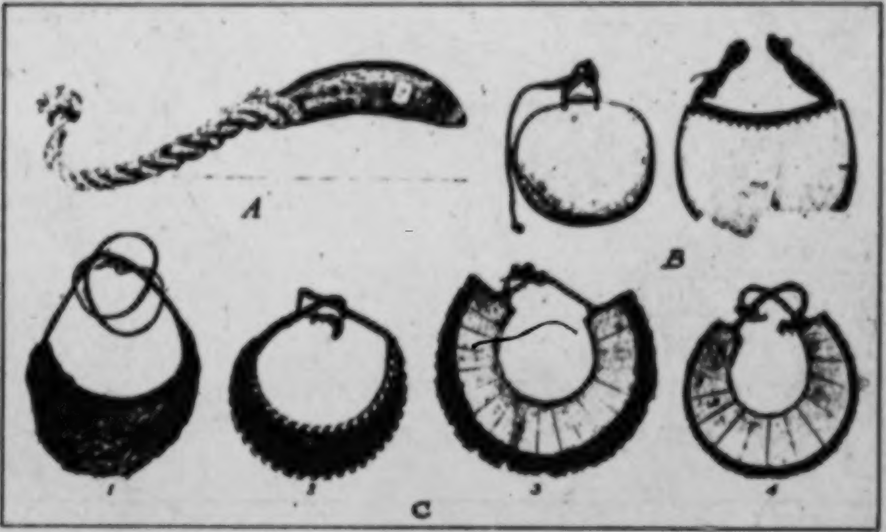
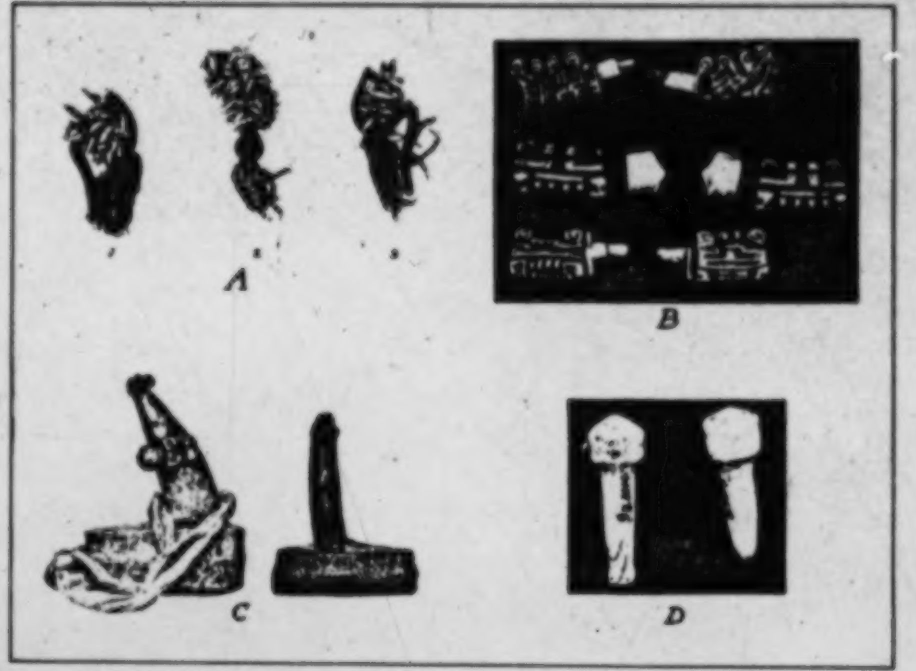


PERSONAL ORNAMENTS: A, WHALE'S TOOTH; B, BREAST ORNAMENTS OF PEARL SHELL, THE ONE ON THE RIGHT ATTACHED TO A SHORT NECKLACE OF BRAIDED HAIR (PEABODY MUSEUM, SALEM); C, GORGETS OF VARIOUS TYPES (PEABODY MUSEUM, SALEM).

[end plate 39]



EAR ORNAMENTS: A AND B, ORNAMENTS USED BY WOMEN; C, ORNAMENTS USED BY MEN; D, ORNAMENTS OF SIMPLE FORM.

[end plate 40]

R. Linton 8:5 (1920-1921) 1923 [illegible]

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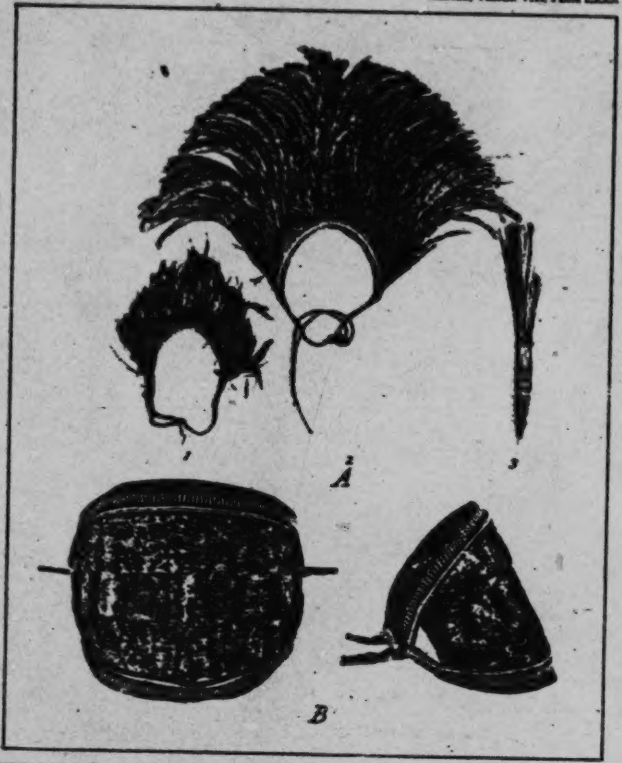
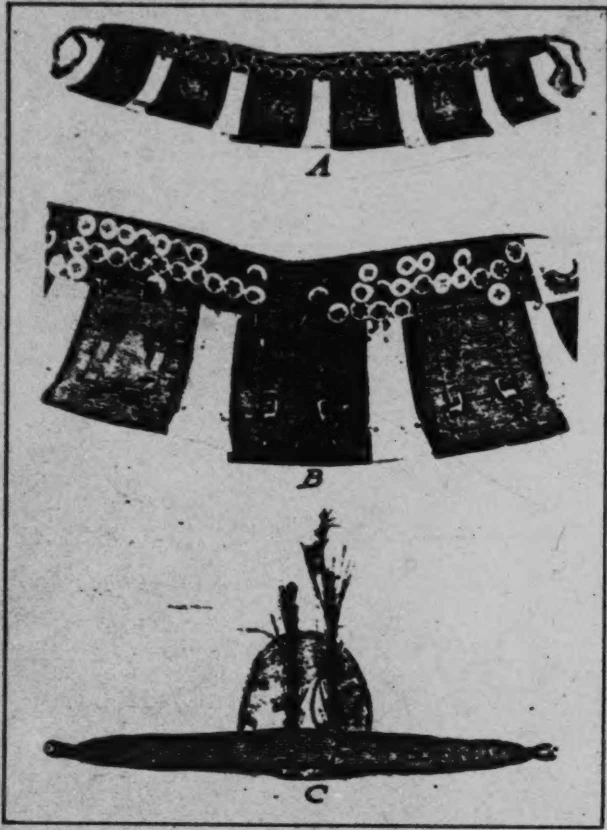


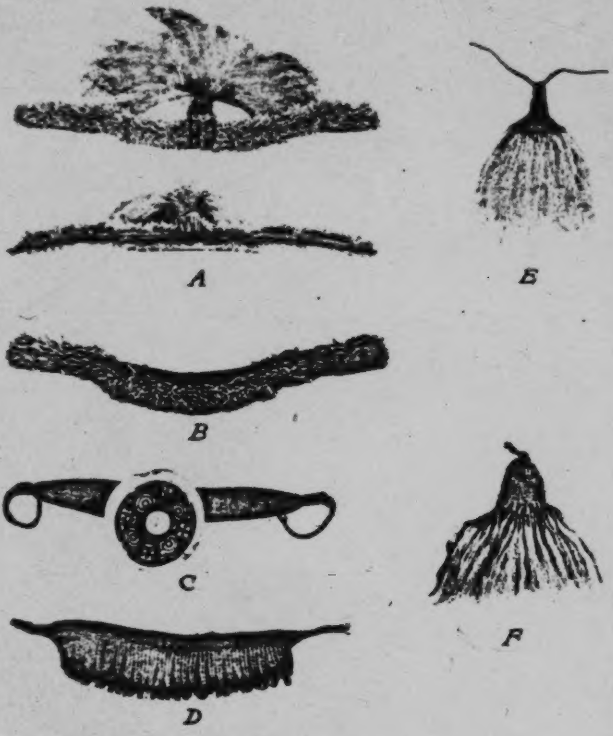
HEADDRESSES: *A*, HEADDRESS OF LONG FEATHERS—1 AND 2 ARE TA'AVAHA, 3 IS A PLUME OF TROPIC-BIRD FEATHERS (PEABODY MUSEUM, SALEM); *B*, PAEKUA, FRONT AND SIDE VIEWS.

[end plate 41]



HEADDRESSES: *A*, PAEKAHA, CROWN OF TORTOISE SHELL AND CONCH SHELL; *B*, PAEKAHA, CLOSE VIEW OF VERY OLD SPECIMEN SHOWING CARVED TORTOISE SHELL PLAQUES; *C*, UHIKANA, ORNAMENT OF PEARL AND TORTOISE SHELL ON A PLAITED BAND, REAR VIEW.

[end plate 42]



HEADDRESSES: *A*, PEUE EI, ORNAMENT OF PORPOISE TEETH WITH PAVAHINA (ORNAMENT OF WHITE BEARD ATTACHED), FRONT AND REAR VIEWS; *B*, PEUE EI MADE OF PIECES OF HUMAN BONE IN IMITATION OF TEETH; *C*, UHIKANA, HEAD ORNAMENT OF PEARL AND TORTOISE SHELL, FRONT VIEW (PEABODY MUSEUM, SALEM); *D*, HEAD-BAND OF BRAIDED COCONUT FIBER (PEABODY MUSEUM, SALEM); *E* AND *F*, PAVAHINA, (*F*, PEABODY MUSEUM, SALEM).

[end plate 43]

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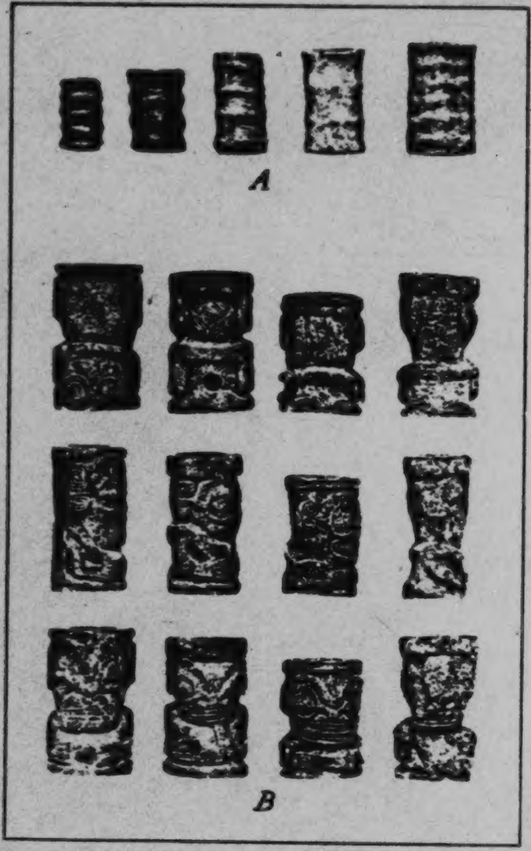

HAIR ORNAMENTS: *A*, TUBES OF HUMAN BONE; *B*, CARVED TUBES OF HUMAN BONE.

[end plate 44]

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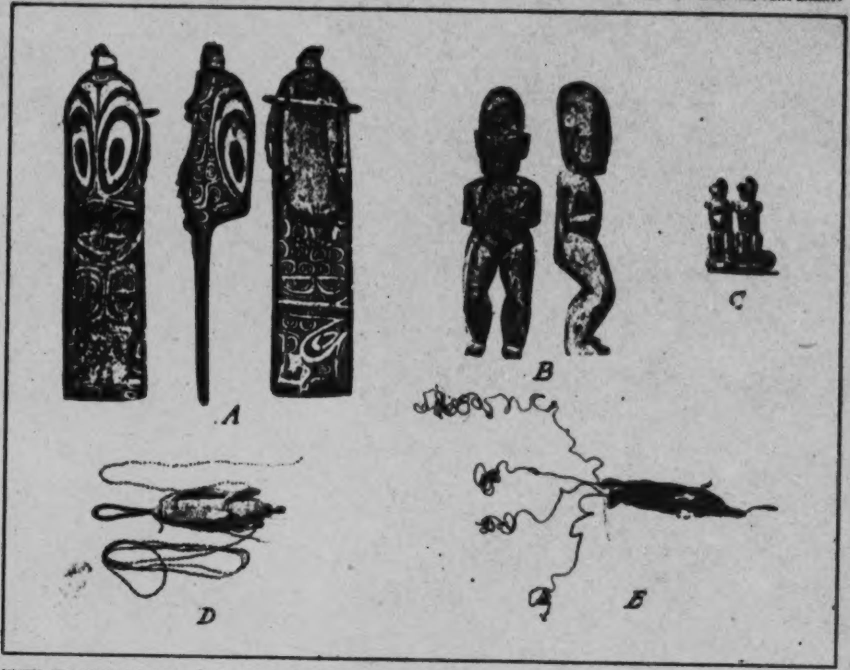

IMAGES AND STRING RECORDS: *A*, TAPA COVERED FIGURE—FRONT, SIDE AND REAR VIEWS; *B*, WOODEN FIGURE—FRONT AND SIDE VIEWS; *C*, SMALL DOUBLE STATUETTE OF TOA WOOD (COURTESY OF MME. MALLIUS); *D*, GENEALOGICAL STRING RECORD (COURTESY OF M. GEORGE LA GARDE); *E*, STRING RECORD USED IN THE RECITATION OF CHANTS.

[end plate 45]